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The Jackson Lecture.[1]

BEARERS OF THE TORCH.

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I SHOULD first like to thank the Council of the Queensland Branch of the British Medical Association for the honour they have conferred on me by asking me to deliver the lecture this evening.

It is a very pleasing sign that, even before a school of medicine was established here in Brisbane, the profession should have thought fit to establish an annual lecture on the subject of medical history. It is a very graceful way of keeping fresh the memory of one who, in a modest way, attempted during your own time to keep alight in your midst the lamp of culture, and to counteract to a certain extent the modern tendency towards mere utilitarianism.

In general, however, a lecture on medical history is a very fitting way to assist in keeping alive the traditions of the profession and of commemorating the endeavours of those who have contributed to medical progress.

The study of medical history, however, is of value for many reasons. In these days of specialities, when the tendency to a narrowness in the profession is on the increase, "no better antidote", says Withington, the eminent English medical historian, "could possibly be found than a study of medical history, a subject which makes us acquainted with the most diverse forms of thought and brings before us every phase of civilization". It also tends to warn us against placing too much trust in authority and against being too eager to adopt innovations.

[1] Delivered at a meeting of the Queensland Branch of the British Medical Association on September 1, 1939.

Perhaps more important, however, is the fact that it makes us acquainted with men whose characters we must emulate and whose lives were devoted to the welfare of their fellow men and to the noble, if sometimes fruitless, search for truth.

When I was asked to give the lecture this year no theme was suggested, and it was left to me to choose one for myself. In a study so wide as medical history, which now has such a vast literature, it should not be difficult to find suitable subjects for an address; but at present, I regret to say, our choice to a certain extent is somewhat limited, by reason of the fact that here in Brisbane the literature available is not very extensive. Any attempt to work up material for an address from original sources is therefore admost out of the question. However, there was really no difficulty over a subject, for I knew that during the present year a great event was to take place here in Brisbane which would initiate a new epoch in the medical history of Queensland. I refer, of course, to the opening of this medical school.

This event marks the close of a long-sustained, if somewhat spasmodic, endeavour to found a centre for medical education in Queensland, and, I hope, ushers in a new era which will be characterized not only by a general improvement in medical practice and culture in this State, but by improved relations and understanding between the profession and the rest of the community.

Before entering upon the theme which I have chosen for my address, I may be forgiven, therefore, on this particular occasion for a short digression on what may be called the making of medical history in Queensland.

The opening of the Queensland medical school must be a great source of satisfaction not only to the public of Queensland in general, but to the medical profession in particular; and all sections of the community, no matter of what political following, have no difficulty in uniting in their approval of the action of the present Government in giving this school such a good start.

If the Government felt obliged to take this step, a still greater obligation assuredly rests on those who will more immediately benefit by its action, and particularly on the medical profession.

However, the Government and people of Queensland ought to be very gratified at the enthusiastic response which the profession at once made when it was called upon to render service not only in providing the team of clinical teachers necessary to carry on the work of the school, but also in other ways, individually and collectively, in contributing to the success of the school.

In this latter connexion mention should first be made of the magnificent benefaction of one of our late colleagues, Dr. James O'Neil Mayne, who left his entire fortune of over £100,000 to assist in the establishment of the school.

The profession also has furnished funds to provide an annual medal for the student who "tops" the final year of the course, and, further, to commemorate the service to the profession, to the university and to the community of our late colleague and Vice-Chancellor of the University, Dr. William Nathaniel Robertson. I am sure that I am expressing the thought of us all when I say that we regret that both he and Dr. Mayne did not remain with us long enough to be present at the opening of the school.

The interest of the profession in the foundation of the school is further exemplified in its donation through the Post-Graduate Committee of the local Branch of the British Medical Association of £100 out of its slender funds towards the cost of an expensive instrument, a micro-projection apparatus, which is now installed in this building. Also, through the generosity of one of our colleagues and a few helpers the sum of more than £150 has been placed at the disposal of the local council of the British Medical Association, which has decided to found a medical students' loan fund to assist worthy but impecunious students in the final year to complete their course. Such a fund should recommend itself not only to members of the profession but to citizens generally and to the students themselves.

Lately again the profession was invited to contribute to a fund to commemorate our late colleague and representative of the profession on the senate of the university, Dr. Eustace Russell. Almost £100 have already been subscribed, and the Council of the British Medical Association has decided to hand over the proceeds of this appeal to the university to found a prize, no doubt for clinical medicine.

In addition to these collective efforts, individual members of the profession have sent along valuable sets of medical periodicals as donations to the library. These include almost a complete set of *The Journal of Physiology* from Dr. Lockhart Gibson, and almost complete sets of *Surgery, Gynecology and Obstetrics* and *The British Journal of Surgery* have been made available to the students by Dr. E. S. Meyers. Others have sent along old instruments, books and the like as well as valuable specimens for the museum.

But help has not come only from the profession. Already a private citizen, Mrs. M. M. Wienholt, has made available the sum of £50 *per annum* to provide a scholarship in memory of her late husband, John Wienholt, to be awarded annually to the most successful student in the third year of the course. Two awards have already been made, one to Mr. J. Russell Neville, who, I hope, will shortly enter his final year, and the other to Mr. W. J. Simmonds, who this year is completing the work for his science degree before continuing with his medical course.

It is pleasing to record too that the efforts being made here were watched in other parts of the world, and soon after the school was established Lord Nuffield helped things along considerably by his donation of £3,500. This timely gift tided the school over a very critical stage and was for that reason doubly welcome.

Acknowledgement has already been made of the substantial help given towards the foundation of the school by the freemasons of Queensland, who gave to the university the old masonic building in Alice Street, and by the Pharmacy Board of Queensland, who made available to the university the College of Pharmacy in William Street; but this acknowledgement is worthy of repetition.

Beside the interest and material help of the profession and others, an important factor in the success of the school has been the confidence of the public. That we have this is proved by the enrolments. Year by year the number of new students enrolling has exceeded expectation. In 1935, before the school was opened, and when the medical students were able to do only the first year of the course here in Brisbane, the number of enrolments was only 27. This year the new enrolments numbered almost 60.

In conclusion mention should be made of the sympathetic cooperation of the Brisbane and South Coast Hospitals Board, who have provided the necessary accommodation in the Brisbane General Hospital for clinical teaching and have cooperated with the university in providing the clinical teachers.

It is seen, then, that although the school has received considerable help from several sources, the profession itself has played a very worthy part and has followed with enthusiasm the lead of the Government in founding the school. It is evident that without the enthusiastic cooperation of the medical profession, the establishment of the school would not have been possible. Such auspicious beginnings, I am sure, augur well for the future success of the school.

The establishment of this school, however, not only ushers in a new era in the medical history of Queensland, but it occurs at a time when I think we are on the threshold of an entirely new epoch in medical history in general.

The past century of great discoveries, the spread of education and democratic ideas, the uplift of mankind in general and the growing conviction of the futility of war, are leading men's minds to higher things.

There is increasing demand for those things which should be the common heritage of all, both rich and poor, and included in these are health and happiness and all those things on which they depend.

In the present century, therefore, we have seen a gradual trend towards a reorientation in ideas of health. Instead of merely devoting itself to cures, the profession is becoming increasingly interested in prevention; and instead of the benefits of the latest results of medical research being reserved for the rich, who can afford them, and to the indigent poor, who have to depend on charity, a readjustment is occurring so that these benefits will be available to all. There is a growing recognition of the fact that health is a social function and that the State should play a greater part.

We have a concrete expression of this recognition not only in the establishment of this school by the Government, but also in the importance given in the curriculum to the study of social or State medicine in all its aspects. This importance is emphasized by the establishment in the school of a special new department, that of social medicine, which has been placed under the control of a professor who at the same time is the Director-General of Health and Medical Services in the State.

Moreover, the school is being established at a time when a great deal of thought has been given in other parts of the world to the revision of the curriculum. Unanimity has by no means been reached, but much of what was thought necessary in the past has by common consent been swept away to make room for what is now considered more essential in the training of medical men. Due regard to such changes has been given in the drawing up of our curriculum here; but there is no doubt that for some time to come, and as experience dictates, it will be subjected to alteration and modification. We are, however, guided in these matters by the requirements of the General Medical Council in England, so that, although emphasis is given here to certain parts of the course, there need be no fear of any fantastic innovations, and the main function of the school will be more or less identical with that of others in the British Empire.

We are not only making history in Queensland by the establishment of the school, but since its foundation in 1936 the school itself has already contributed to the making of medical history. Shortly after its foundation the Commonwealth Advisory Council on Nutrition undertook its important investigation, and the local Queensland Nutrition Council was established.

The work of the Queensland Nutrition Council has been second to none in the Commonwealth, and, as was recently stated in The Medical Journal of Australia, "those responsible for the activities of the Queensland Nutrition Council have blazed a path of progress which other States could follow with advantage".

Although the council is composed of representatives of the university, the profession and other bodies, I think it will be agreed that the establishment of the medical school has been a great factor in its success. Full recognition of the work done by the council, however, and of the part played by the department of physiology of the medical school, are given in a recent number of The Medical Journal of Australia, so that there is no need for me to dilate on the subject here.

Although we may assume that in many respects the foundations of this school have been well and truly laid, I should like to point out that the success of the school does not entirely depend on such things as the provision of the necessary equipment and accommodation, on the goodwill and support of the community, or on a curriculum, but to a great extent on those to whom will be entrusted the work of guiding the activity and development of the students and on those who will make use

of the accommodation and equipment in advancing our knowledge. All such I refer to as "bearers of the torch".

It is for this reason, and on this special occasion when many of you are assuming the new responsibility of medical educators, that I thought it appropriate to commemorate some of the great medical teachers and investigators of the past, so that we might gain inspiration for our own endeavour from their character and labours.

I believe it was Henry Drummond who said that "we grow like those we most admire". It is a well-known fact that students unconsciously tend to imitate, adopt mannerisms and otherwise reflect the characteristics and qualities of their teachers, and it is well to recognize this fact. In the galaxy of teachers and investigators strewn across the firmament of medical history, each one of us, no matter in what field he may work, has no difficulty in finding someone whom he may emulate, whose methods he may study and whose example he may attempt to follow.

It is not my intention to expound on the fundamentals of educational theory and practice; but I should point out at the start that as teachers we are expected to transmit a certain body of knowledge and that as educators must so manipulate the environment of our students that they find it suitable for their unfolding either as medical practitioners or as medical investigators.

Besides sound knowledge and skill medical men must have character, culture and refinement, and it is still more essential that our teachers should have these qualities if they are to see these things develop in their students.

Also it should be emphasized that teachers should be learners, and when they cease to learn they are no longer competent to teach.

In making my choice of those I wish to commemorate this evening I have been guided by these facts; but a study of the lives of our great men will show that it is not possible to define a type, for, although many have what might be regarded as fundamental qualities, each often has his own peculiar method and has achieved success often on account of an almost unique quality of character.

All schools in all countries and in all times have had their great teachers; but the memory of most has passed away with those with whom they came in contact. They either had no Boswell or left no written record of their work. For example, it was said of one of the great clinical teachers of our time that "he never spilt a drop of blood, never used a drop of ink, and never said a word". He taught mostly by example, and could be honoured only by those who were associated with him and were privileged to see his work.

Knowledge gathered at the time during which many of them lived has to a certain extent long been discredited, so that their labours did not have any great influence on the development of medical science. No doubt we could find many among them worthy of mention; but our time is limited.

Throughout the course of history, however, there have been a few who by their genius and special qualities of character have exerted a tremendous influence and whose labours have diverted the whole course of medical history. Although most of these are no doubt to a certain extent familiar to you, I have restricted my choice mostly to them, for they not only exemplify those qualities which we should emulate, but they are those in whose grasp "the torch", at times almost extinguished, flared up into a bright flame whose radiance gave new life and inspiration to medical research and practice.

As Carlisle stated:

> A great man is really a living light-fountain, whose light enlightens, not as a kindled lamp only, but rather as a natural luminary, shining by the gift of Heaven, a flowing light-fountain of native original insight, of manhood and heroic nobleness.

A study of history will show, however, that even the great men depended on the work of forerunners who prepared the way, and that their greatness is in part due to the fact that they recognized the achievements and mistakes of the past and made full use of the knowledge and facilities of their day for bringing about a readjustment of ideas. In the words of Carlisle:

> No thought, word or act of man, but has sprung withal out of all men, and works sooner or later, recognizably or irrecognizably, on all men.

This should give us some comfort, for although such great men are rare, we can all, according to our light, serve some useful purpose.

The times, however, call forth the man; and so in drawing attention to a few of our great men and giving some idea of the influence they had on the development of medicine as a science, I have thought it essential to say something of the times leading up to that in which they lived, and to mention some of the factors associated with their appearance. Without this their work and character cannot be fully appreciated, nor can their influence be fully assessed. Also by doing this I am able to give an outline of the main steps in the advance of medical investigation and knowledge.

Imhotep.

The first great physician mentioned in history is Imhotep, the Egyptian priest-physician of the pyramid age, and designer of the step pyramid at Sakarah. He lived, according to Breasted, somewhere about the thirtieth century B.C., nearly five thousand years ago. In later centuries Imhotep's memory was held sacred in hundreds of temples, and in conformity with the tendency of the time towards deification of great men, he became identified with Thoth, the god of healing.

The medical lore of a very remote past was handed down from generation to generation by the Egyptian priests, and this tendency to perpetuate traditional teachings and practice was enhanced in Egypt through the working out of a system of writing, one of the greatest achievements of the ancient

Egyptians. By the time of Imhotep this system had passed through most of the stages which mark the usual development of a written language.

The written records of incantations, spells, exorcisms, prescriptions, clinical observations and surgical procedures were maintained intact from age to age and were finally embodied in compilations which became known ultimately, at least in part, to Hippocrates and other Greeks of the Periclean age; of these specimens survive in the medical papyri of our libraries and museums.

In the words of Libby:

> On account of the conservatism of the priest-physicians, Egyptian medicine never advanced far beyond primitive medicine with the simple faith in magic spells and the virtue of a rich pharmacopœia, and its belief that the cause of disease was the malice of a demon, the justice of an avenging god, the ill will of an enemy, or the anger of the dead.

We know little of Imhotep's life and character; but he must have been a great administrative genius of indomitable energy and with a well-ordered mind. Although I can find no direct evidence of the fact, I like to think that he owes his fame, at least in part, to the fact that it was probably he who first recognized the value of the new invention of writing and attempted the organization of such medical knowledge as was known at his time and inspired the work of perpetuating it in written records. He can thus be regarded as exemplifying the qualities of a great teacher who attempted to organize knowledge for transmission to posterity.

In the ancient civilizations it was seen that the activity of the priests preserved throughout ages the medical knowledge of an immemorial past; but their reverence for and faith in tradition were detrimental to progress and prevented their making any real advance towards medicine as a science.

The distinction of making the first contributions to scientific medicine was reserved for a people of a much later date, among whom the healing art was not dominated by the priestly caste. These were the Greeks.

The Greeks.

The ancient Egyptians and Babylonians flourished in the age of copper and bronze; but the discovery in Asia Minor of a commoner and more useful metal, iron, ushered in a new era. It was during the reign of Rameses II (1292 to 1225 B.C.), probably the greatest of the Egyptian Pharaohs, that we first hear of the use of iron weapons. Rameses, besides being a great builder, was a great warrior, and his chief wars were those against the Hittites, who at that time had an extensive empire embracing in the main the interior uplands of Asia Minor and Syria.

Owing to the discovery of iron in Asia Minor, from the time of Rameses II for the next thousand years there was a great struggle for mastery in western Asia and eastern Europe, and great civilizations successively arose.

Such periods of turmoil, unrest and uncertainty are not conducive to the development of the higher faculties. Great advances in knowledge are made only by men who have reasonable opportunities for contemplation, concentration and research, and, above all, freedom to express their ideas.

However, wars have played some part in the development of the human race. There is no doubt that they have been a great factor in the development of many of its finest qualities, and in addition to this they have brought about the mixing of peoples of different cultures and character. Medicine too owes much to war, and the influence of war on the art of medicine would make a very interesting study.

Emerging from these dark ages of ancient times, we find a people, the Greeks, endowed with a quick and versatile intellect and dominated by a love of freedom. Under Greek influence we see the lamp of culture fanned into a blaze, the light of which, even after its source was extinguished, radiated throughout the world and influenced human thought and endeavour right down to our own time.

Even in the early stages of Greek culture, and long before the age of Pericles, the part played by the priesthood in the healing art had come to be only a subordinate one. The physicians had gradually become distinct from the priests and formed rather an adjunct to the warrior caste. In the Homeric poems, for example, Æsculapius is a great warrior who had received instruction in the healing art, and his two sons were warriors and army surgeons. Later, tradition endowed him with supernatural powers and he became the god of medicine, son of Apollo, and the father not only of the surgeon Machaon and the physician Podalirius, but of a younger son, Telesphorus, the god of convalescence, as well as of Hygeia and Panacea.

Three great influences contributed to the development of Greek medicine: theology, philosophy and athletics; and these acted through the temple, the school and the gymnasium. By the time of Pericles we find hundreds of temples throughout Greece dedicated to the worship of Æsculapius, and many schools of philosophy and great gymnasia.

The temples mostly tended to carry on the traditions of the priestly caste, while the schools of philosophy sought to explain phenomena in the light of reason. The gymnasts, however, were the devotees of practice, and through experience acquired skill in the treatment of injuries and of various disease conditions. These three great influences on Greek medicine, although logically distinct, became gradually merged, and the genius who contributed most to this development was Hippocrates (460 to 370 B.C.).

Hippocrates.

Though there were great physicians and teachers before Hippocrates, to whom he himself always rendered due homage, the reforms he introduced were so important and the impress of his genius left upon the art of medicine was so great that he well deserves the title of "Father of Medicine". His main claim to immortality is the fact that he did

so much to emancipate the art of medicine from superstition and ignorance and to establish it as a scientific study. His central doctrine was that there are laws of disease as well as laws of health; and in his attempt to establish cause and effect or antecedent-consequent relations in disease conditions, he emphasized on the one hand the necessity of accurate observations and the recording of case histories, and on the other the importance of prognosis.

Hippocrates virtually founded that bedside method which has been the distinctive talent of all true clinicians. Huchard stated that the revival of the Hippocratic methods in the seventeenth century and their triumphant vindication by the concerted scientific movement of the nineteenth century are the whole history of internal medicine.

Claude Bernard stated that "observation is a passive science, and experiment is an active science". Hippocrates was not acquainted with experiment; but no physician ever profited more by experience.

The main principles of the Hippocratic method are still applicable, and teachers and physicians of the present day can still gain inspiration for their labours from a contemplation of his life and work.

Hippocrates not only gave Greek medicine its scientific spirit, but he gave the medical profession the highest moral inspiration it has. His elevated conception of the dignity of the physician's calling and his deep respect for his patients have exerted an influence on professional conduct right down to the present day.

Hippocrates voiced the spirit of an entire epoch; but after his time the open-minded receptive spirit of his teaching gradually disappeared and was replaced by a dogmatic formalism.

Although in later ancient times we occasionally come across original investigators worthy of mention, such as Herophilus and Erasistratus of the Alexandrian school, and Celsus and Galen in Rome, no great advance towards scientific medicine was made. The old spirit was gradually stifled, and after the death of Galen it did not raise its head again for nearly fourteen hundred years.

The Arabs.

The traditions of the past were transmitted by the Arabs; but it was not until long after the death of Mohammed, when the mighty empire which he had founded was subdivided into caliphates, that the arts and sciences were permitted to develop. Even then the Arabs did little more than encourage the preservation of ancient tradition. One great clinician, however, appeared during their period of dominance, namely, the Persian Rhazes (860 to 932). By some authorities he is ranked with Hippocrates and Sydenham as original portrayers of disease, and is considered a true follower of Hippocrates in the simplicity of his practice.

Another famous physician of the period was Avicenna, also a Persian (980 to 1036), who had a flourishing practice in Bagdad, was court physician and vizier to different caliphs, and was head of the famous Bagdad hospital. He is said to have been a prolific writer and has been credited with the production of more than one hundred works on different subjects, including a vast encyclopædia, the so-called "Canon", in which he attempted to codify all the medical knowledge extant at the time. His Latin texts were very popular in Europe during the Middle Ages; but, as Garrison states, on the whole the influence of the "Canon" was bad, in that, amongst other things, "it confirmed physicians in the pernicious idea that ratiocination is better than first-hand investigation".

The influence of the Arabs on the development of scientific medicine in Europe, however, was very slight. No doubt the impact of Europeans against the Moslems during the Crusades, and the increased trade which subsequently sprang up between Europe and the Orient did have some effect; but it was little more than the mere transmission of ancient authority.

In the transition of civilized mankind from mediæval to modern conditions, however, many forces were operative. Of these, undoubtedly the most potent for the growth of individualism and release from the ban of authority were the invention of gunpowder, which brought about the downfall of feudalism, and the invention of printing about 1440, which is considered by many to be one of the greatest discoveries of the human race. With these inventions, and with the discovery of America in 1492, the circumnavigation of the globe by Magellan, the astronomical investigations of Copernicus, and the Reformation, free thought came into its own again and the critical spirit grew apace. The fall of Constantinople to the Ottoman Turks in 1453 was another great factor, for it brought about the migration westward of Byzantine scholars, and the revival of the culture and spirit of inquiry of the ancient Greeks. The sack of Mainz about 1462 is also important, as it scattered the German printers over Europe, so that the effect of the invention of printing was more quickly felt.

Leonardo da Vinci.

The supreme genius of this time was Leonardo da Vinci (1452 to 1509), the greatest artist and scientist of the Italian Renaissance. He was pre-eminent in several spheres of art and science; but here we are particularly interested in Leonardo as an anatomist and physiologist.

Being an artist, he was naturally interested in the structure and function of the human body; but being a scientist imbued with the spirit of the time, he sought a deeper knowledge than that given by mere observation of the external form. The masterpieces of the Greeks and later artists show what can be achieved by mere observation; but he supplemented this by actual dissection, and is said to have dissected more than thirty subjects, both male and female. He made over 750 sketches illustrating his observations on human anatomy and physiology, and they were so startlingly accurate

and so skilfully and artistically executed that many of them have never been improved upon.

Leonardo's influence on the development of medical science, however, was limited, as he failed to bring to completion the projected work on anatomy, for which he had made such magnificent preparation. The drawings he made remained buried and unknown to the schools for over two hundred years, when they were seen by William Hunter in 1784, and so the anatomy of the schools was not yet to be released from the ban of Galenic tradition. The man who released human anatomy from traditional authority and based it on actual observation of careful human dissection was Vesalius (1514 to 1564).

Vesalius.

There were plenty of dissectors before Vesalius, but he alone made anatomy what it is today—a living, working science.

Vesalius studied anatomy in Paris under the Galenist, Sylvius, but took his doctor's degree at Padua. Before his twenty-third birthday he was appointed professor of surgery at Padua and began to teach anatomy. Almost at once he departed from the established practice of reading Galen in the lecture room and directed attention to what he afterwards referred to as "that true Bible—the human body". The lecturer thus turned demonstrator, appealing from the authority of Galen to the evidence of the senses.

After five years of actual dissection he embodied his observations in a systematic and well-illustrated work, "On the Structure of the Human Body", or, to give it its Latin title, *"De Humani Corporis Fabrica"*, commonly known as the *"Fabrica"*.

This magnificent work, which Osler regards as the greatest book ever written, was completed in 1542 and printed in 1543. It represents a clean sweep of the whole subject. Soon after its appearance it may well be said that Galenic anatomy was disposed of for all time.

The effect of so radical a publication was immediate. Vesalius was attacked on all sides. Even his old teacher, Sylvius, called him "a mad man whose pestilential breath poisons Europe".

Discouraged by the opposition offered to his expositions of the truth, and no doubt subjected, as is often the case, to subterranean persecution at the instance of authority, Vesalius resigned his professorship, became physician to the Emperor Charles V and later to his son Phillip II, eventually taking up residence in Spain. He was destined never again to pursue his anatomical studies.

But Vesalius gave a new impulse to the study of anatomy, and a few years after the publication of the *"Fabrica"* the professorial chairs of the universities of Italy were filled with men whose names are familiar in every dissecting room, Arantius and Varolius at Bologna, Vidius at Pisa, Eustachius at Rome, Ingrassius at Naples, and in 1551 Vesalius's post at Padua was undertaken by his favourite pupil, the famous Fallopius.

When Vesalius received Fallopius's "Anatomical Observations" in 1561 the aspirations of his youth were kindled anew, and in 1563 he decided to make a pilgrimage to Jerusalem, some say as a pretext for leaving surroundings which now had no attraction for him. On his way back, in 1564, he received word of the death of Fallopius, and an invitation to accept his old chair at Padua; but he was shipwrecked and died a lonely death from some obscure malady on the desolate shores of the island of Zante. Although his great wish to resume his work was never gratified, he had the satisfaction of knowing before he died that the torch he had rekindled had passed to kindred souls, and that the movement which he had initiated was beginning to spread far and wide and was sweeping all before it.

Garrison states that through the work of Vesalius anatomy became the starting point of modern medicine. It prepared the way for Harvey and scientific physiology, and when dissection became commonplace, the closer study of pathological appearances became a necessity and disease came to be visualized anatomically.

Paré.

The effect of Vesalius's work on surgery, however, was immediate. Many of the great anatomists of the time were also able surgeons; but the most brilliant surgeon to emerge at this period was a Frenchman, Ambroise Paré (1510 to 1590). He at once saw the value of the *"Fabrica"* and made it popular and accessible to the surgeons by writing an epitome of it in the vernacular. Paré followed Vesalius in basing his knowledge of anatomy on actual dissection and, ever learning, found time to write two works on anatomy and several on surgery.

What Vesalius did for anatomy, Paré, in a measure, did for surgery. He reintroduced old methods and invented new ones, and he also invented many new instruments. Although he rose from the lowest rank of his profession to be councillor of state and surgeon to four kings of France, he maintained a humility begotten of knowledge and strengthened by experience.

This is exemplified in his famous words now engraved upon his statue: "I dressed him and God cured him."

Although the effect of Paré's work was felt almost immediately in surgery, its effects on medicine as distinct from surgery were much slower in making their appearance. This was due to the fact that at first there was no commensurate advance in scientific physiology. Without this there can be no science of medicine.

Harvey.

It was not until 1628, nearly a century after the appearance of the *"Fabrica"*, that Harvey published his work on the circulation of the blood. This then did for physiology in the seventeenth century what the *"Fabrica"* had done for anatomy in the sixteenth century.

On account of the importance of Harvey's discovery, his name by many is placed in the history of medicine second only to that of Hippocrates. He initiated research which eventually let in a flood of light on medical problems and suggested the causes of many diseases and the best mode of treating them. The work of Harvey can be considered, therefore, as the chief corner stone on which has been built a rational and progressive science of medicine. "Before Harvey", states a great French physician, "the sick man was looked on from without—the symptoms; since Harvey, he is looked upon from within—the function."

About this time the invention of the compound microscope, which had taken place early in the century, directed attention to microscopy, and Malpighi and others, whose work began to appear in the second half of the century, gave a new impulse and outlook to anatomical and physiological research. In 1661 Malpighi, for example, was able to give ocular proof of the circulation.

It is true that the early compound microscopes were not satisfactory; but about 1650 a way was discovered of grinding and mounting small and simple lenses of sufficient power to enable considerable advance to be made in microscopic work. It was not until the latter half of the nineteenth century that any great improvements were made in the compound microscope, so most of the early microscopic discoveries were made with the simple lens.

But all the knowledge of anatomy and physiology in the world will not of itself make a scientific physician. His problem is a sick and suffering patient, and his first task is to make a thorough study of all the circumstances associated with disease.

However, the scientific method of observation and experiment as the only effective method of eliciting the laws of Nature had now well established itself and had reached an ever-widening circle, and it led during the seventeenth century to an extraordinary wealth of scientific discovery in all fields of human endeavour.

It could be anticipated, therefore, that a definite advance would sooner or later be made in the scientific study of disease.

Sydenham.

The first great figure to appear in this field was an English physician, Thomas Sydenham (1624 to 1689), who has come to be regarded as "the English Hippocrates".

Sydenham's predominant interest was in his patient. He was not so interested in the discovery of some minute part of the human body and its function, and thought it impossible for the physician to discover the ultimate causes of the majority of diseases. These he considered inscrutable. In his opinion it was quite sufficient to know whence the mischief immediately arose. In his own words:

> The whole philosophy of medicine consists in working out the histories of the diseases, and applying the remedies which may dispel them, and Experience is the sole guide.

As Singer puts it:

> Although Sydenham did not make any great discovery he did more than discover—he introduced a new method of approach. He was the founder of clinical medicine.

Boerhaave.

The work of Sydenham made him famous not only in England, but on the continent of Europe. For a time, however, its influence was not felt in the schools. The first great clinical teacher was Hermann Boerhaave. Boerhaave was a great admirer of Sydenham. He is said never to have referred to him without removing his cap in salutation to "the Light of England, a very Phœbus of the Art and a true disciple of Hippocrates".

Boerhaave (1668 to 1738) was born and educated at Leyden, and in 1701 became a teacher there in the medical school. This school had gained a certain reputation during the seventeenth century; but after the appointment of Boerhaave it soon became one of the most famous in Europe, its reputation surpassing even that of Padua.

Boerhaave was a profound scholar of wide culture and many accomplishments, and was better able than any man of his time to bring all the sciences to the service of the patient. At his demonstrations, besides giving clinical, chemical, botanical and anatomical instruction, he followed to the *post mortem* room those of his patients who died, and there correlated lesions with symptoms.

Singer uses these words:

> Taking one thing with another, considering his influence as a teacher, his clinical acumen, his power of inspiring young workers, his wide learning, his balanced vision, his eagerness for new knowledge, and his humanity, Boerhaave must be regarded as one of the greatest physicians of modern times.

It was Boerhaave's pupils who founded the Edinburgh medical school, and its success was largely due to his inspiration. This school in turn exerted such influence on the medical schools of English-speaking countries throughout the world that our debt to him is incalculable.

Morgagni.

During the time of Boerhaave great advances were made in pathology. This was largely due to the work of Morgagni (1682 to 1778). In 1715 Morgagni was appointed to the chair at Padua which had been occupied by Vesalius, Fallopius and many other distinguished anatomists, and he remained there until he died.

Morgagni was in his eightieth year when he completed his five books of *"De Sedibus"*. These books, according to Virchow, contain all that was known up to that time concerning changes produced by disease in the structure of the human body, and are regarded as the greatest landmark in the history of pathology. Morgagni, by the way, was only one of many who can be mentioned as examples of men who, at an advanced age, were still capable of producing important creative work.

Bichat.

In the year that Morgagni died there was born another, Bichat, whose work extended the province of pathology from mere naked-eye pathological anatomy to a study of the tissues. Bichat was one of the shortest lived, but one of the greatest heroes of medicine.

Although far from robust, he pursued his studies with incredible energy and infused his associates and students with ardour and enthusiasm. His was a rare personality, and his natural charm and grace, united with an amiable and magnanimous disposition, exerted a rare influence on all who came in contact with him.

His ceaseless activities affected his health and lowered his resistance to infection. One day he examined some tissues which were in such an advanced stage of putrefaction that his students were driven from the room by the odour. Bichat himself went on with his examination for a time, but finally he too was forced to withdraw. As he did so he fell and struck his head and for a time was rendered unconscious. Next day he tried to resume his work, but he was too ill to carry on. After a short illness he died of typhoid fever at the early age of thirty-one years. Corvisart, Napoleon's favourite physician, in a letter which he wrote to Napoleon at the time, said: "Bichat has just died on a battlefield which has claimed more than one victim. No one, in so short a time, has done so much and so well."

In many respects Bichat reminds us of a young Australian who was known to some of us here; I refer, of course, to the late Professor John Irvine Hunter, who, although appointed to the important chair of anatomy in the University of Sydney at the early age of twenty-four years, gained world renown before he died at the early age of twenty-six. There are many qualified to express an opinion who think that the words of Corvisart would be equally appropriate in the case of Hunter.

Hunter.

Of the great men of the eighteenth century, however, none deserve mention more than the two great Englishmen John Hunter and Edward Jenner.

John Hunter was rather a "rough diamond" in his youth, and gave little indication of his future greatness. No one would have taken him for the brother of the cultured William Hunter. However, after Hunter went to London, his brother William, who was probably the first great teacher of anatomy in England, got him interested in dissection and engaged him as a demonstrator, and from then on he never looked back. He gained great success as a teacher, for among his pupils were the foremost surgeons of the day.

There was one characteristic of Hunter which must have appealed to his students and affected their attitude, and that was his open-mindedness. One day as he was giving instruction, "Sir", asked a student in surprise, "did you not say the opposite of that last year?" "Very likely I did", said Hunter, "but I hope I grow wiser every year." And on another occasion: "Never ask me what I have said or what I have written", said Hunter, "but, if you will ask me what my present opinions are, I will tell you."

As Hunter's mind matured, his passion to study Nature increased and his curiosity became insatiable. He was forever experimenting and discovered much. For example, his application of the discovery of a collateral circulation in the antler of a deer to the surgery of popliteal aneurysm is famous. This discovery alone has rescued thousands from deformity or death.

Hunter regarded science as the essential basis of practice, and hoped by his investigations to establish new methods of treatment. Many of the reforms he effected in the profession were the direct result of his comprehensive study of natural phenomena. He is regarded as one of the greatest lights in surgery, and in fact was the founder of scientific surgery.

Jenner.

With regard to Jenner, it has been said that of the great events of the eighteenth century none was so grand in its total results as his discovery of vaccination. But our enthusiasm is inspired not only by his work but by his character. We often hear of unselfish devotion and of pure love of humanity, and in Jenner we find both gloriously exemplified. His high moral qualities are seen in his refusal, although a poor country practitioner, to capitalize his discovery. Cline, who had tested Jenner's vaccine, became enthusiastic, and, backed by others, advised him to leave the country and come to London, where, they prophesied, he would become famous and make at least £10,000 per year. Jenner, however, could not be persuaded, and his reply to Cline is very characteristic of the man. He wrote:

> Shall I, who even in the morning of my days sought the lowly and sequestered paths of life—the valley, and not the mountain; shall I, now my evening is fast approaching, hold myself up as an object for fortune and for fame?

He went on to say that he could not see how fame and fortune could add to his happiness, as he had all he wanted where he was. "And as for fame", he wrote, "what is it? A gilded butt, forever pierced with the arrows of malignancy."

Jenner aroused considerable opposition and jealousy, misrepresentation and ridicule, and even suffered financial losses; but he struggled on bravely, confident that finally a horrible and destructive agent would be removed from society. He died with the nobleness of his character and the greatness of his discovery universally acknowledged.

Such was the gratitude of mankind that honours fell thick upon him from all over the world, and he attained an influence throughout the world probably never before acquired by a private individual. The following incident will give some indication of this. Two Englishmen, Dr. Wickham and another, were detained by Napoleon in Geneva, and all efforts

to obtain their release were of no avail. Finally Jenner wrote, requesting that they should be set free, and they were, Napoleon saying: "Jenner! Ah, we can refuse nothing to that man!"

By the beginning of the nineteenth century the foundations of modern scientific medicine in all its branches can be said to have been well and truly laid. This had been the work of three centuries. In the sixteenth century Vesalius had revolutionized anatomy and Paré had given a great impulse to surgery. In the seventeenth century physiology was founded by Harvey's discovery of the circulation of the blood, and Sydenham founded modern clinical medicine. The eighteenth century saw the reformation in clinical instruction produced by Boerhaave, the foundation of modern pathology by Morgagni and Bichat, the advances of Hunter in scientific surgery and the discovery by Jenner of vaccination.

The great progress which medicine made during this period was the result of the spirit of the times and the release from servility to ancient authority, as well as of a clearer intellectual atmosphere, which the centralization and greater stability of governments, the increased domestic quiet and higher social conditions of the various nations had brought about.

On the foundations thus laid the nineteenth century saw the growth of modern organized scientific medicine and, while this is still progressing, we have witnessed in this present century the beginnings of organized preventive medicine.

As research proceeds, its sphere expands towards an ever-widening horizon, and so there will always be plenty of scope for profitable inquiry.

Since the beginning of the nineteenth century we could find many who by their character and labour have not only advanced the science and art of medicine, but have exerted an enormous influence on their students and have inspired in them an intense love of their work; and there are many, like Hughlings Jackson, with his kindly face, courteous manner and sweet reasonableness, who had a wonderful influence on all those who were privileged to sit at their feet. But the drawing out of my theme results only in a reiteration of those qualities which have characterized our great teachers and which have been adequately exemplified in those already mentioned.

Lister.

Nevertheless, for the benefit of our clinical teachers, I cannot refrain from a brief reference to the influence of Lister. It is said that even in his early days, when he was only a house surgeon, the dressers who worked under him hailed him affectionately as "the chief"; but throughout his life he always commanded the respect and attracted the devotion of students. Although at times he thought it necessary to reprove them, he did so in a kindly manner and nearly always in private, so that it was impossible for them to take offence or harbour resentment. With regard to his patients, Godlee, in his biography of Lord Lister, states that he was so sympathetic, so patient and so minute in his attention to their wants that they almost worshipped him, and that his gracious manner and thoughtful face gave such an impression of power and resource and of mastery of the situation and preparedness for the possible emergencies which haunt the minds of nervous invalids, that when they passed from his hands they felt that they were saying good-bye to a friend. It was on account of the way he handled his patients that Roxburgh, the last of Lister's Edinburgh house surgeons, said that in Lister's wards it was not only the healing art that was taught, but they were a school of gentleness and human sympathy. It is impossible to estimate the value to a medical school of the influence and example of such a teacher.

But since the beginning of the nineteenth century there are many other clinicians whom I could mention. For example, I should like particularly to have told you something of Laennec, the inventor of the stethoscope, of Graves, Addison, Bright, Osler and Mackenzie, and many others. Also I should like to have said something about great investigators, like Koch, Pasteur and Virchow, Darwin and Huxley, Claude Bernard and Pavloff, Purkinje and Cajal, and Marie and Pierre Curie, only to mention a few; but even if time permitted, it is unnecessary for the conveying of my message.

Conclusion.

My main purpose this evening is to show you that the study of the lives of our great men teaches us that the secrets of success of great teachers and investigators are not only energy and enthusiasm, knowledge and insight, but that they need to be convinced of the truth of their teaching and of the value of their work, and we learn, particularly from the life of Vesalius, the need for courage, from that of Jenner the need for patience and selflessness, and from that of men like Hughlings Jackson, Lord Lister and William Osler the value of a lovable personality.

All these qualities, I think, can be effectively summarized as depending primarily on love of the art, love of work, love of students and love of truth.

The last hundred years have seen a great increase in the number of medical schools, and the present century, especially since the Great War, has seen an enormous increase in the number of workers and in the volume of their output. This has been largely due to the enormous foundations for medical research which have been made by wealthy corporations, such as the Rockefeller foundation, and by individuals, and in various countries to the assistance of their more enlightened legislators, all inspired no doubt by the conviction that health is the mainspring of success and happiness. No more profitable investment could be made than that in projects which tend to promote the health and well-being of a people. The root of these projects is in our medical schools, and so those who are called to work in them should be well equipped for their task and have a due regard for their responsibilities.

I have tried this evening to give you some indication of the value of medical history in helping you to gain some inspiration for your work by a contemplation of the methods, work and motives of some of the men who have done so much for our profession in the past, and especially of those who were responsible for guiding the destiny of our centres of education and research.

They are the "bearers of the torch", and in their hands it has passed from one to the other with ever-increasing brilliance. It remains for us at the present day to see that its flame is in no way diminished, and it should be the aspiration of those connected with this school to contribute to its radiance.

As a reminder of this, every time you pass into this building by the main entrance you will see on either side what suggested to me the title of this address—the symbol of the burning torch; and as an indication of the influence which I hope this school will have on our future graduates, on the shield which is placed over the rear entrance (that which will probably be used most frequently by the students) you will see the motto composed by our classical colleague, Professor Michie: *"Colatur ars ut vita excolatur."*

OVARIAN RUPTURE CAUSING INTRAPERITONEAL HÆMORRHAGE, WITH A REPORT OF THREE CASES.

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It is my purpose to consider hæmorrhage into the Graafian follicle and *corpus luteum* or their derivatives as a cause of intraperitoneal hæmorrhage. Hæmorrhage due to ovarian pregnancy or to the true neoplasms of the ovary, such as the cystadenomata or carcinomata, is excluded.

Historical.

Nelaton, in 1851 (Ravdin, 1923), was aware of the possibility of hæmorrhage from a ruptured Graafian follicle; but the condition achieved little prominence in the literature, and in 1930 Johnson found only 77 cases of ovarian rupture recorded prior to that date. In 1936 Greenhill stated that the condition was much more common than the literature would lead one to believe. L. Israel (1937) found that 300 cases had been reported up to January, 1937, and he added 10 more from his own practice.

These figures illustrate a growing awareness of this condition amongst medical practitioners, so that intraperitoneal hæmorrhage due to ovarian rupture is now a well-recognized clinical entity.

Case Reports.

Case I: Torsion of a Follicular Cyst Leading to Intraperitoneal Hæmorrhage.

The patient, a married woman, aged twenty-three years, had a normal menstrual history, the periods occurring every twenty-eight days and lasting four days. There had been no dysmenorrhœa, except on the first day of her last menstrual period, which finished seventeen days before her illness.

She had never had abdominal pain before this attack, which commenced with sudden severe pain on the day of her admission to hospital. The pain was localized to the right iliac fossa, but soon radiated to the right lumbar region. Its severity made her vomit and it lasted for four hours before the intensity lessened.

Examination disclosed a young woman of good colour, with a normal temperature and a pulse rate of 100 per minute. She was very tender and rigid in the right iliac fossa. Pelvic examination disclosed a firm cervix with a small anteverted uterus. There was no blood in the vagina.

A preoperative diagnosis of bleeding into an ovarian cyst or torsion of an ovarian cyst was made. An ectopic gestation was also considered.

Operation through a right lower paramedian incision disclosed many large blood clots in the abdomen, with a little free bright red blood. The right ovary was entirely replaced by a large thin-walled cyst, later proved by microscopic examination to be a follicular cyst. This was full of blood clot, and a rupture in its wall in one place allowed the escape of blood into the peritoneal cavity. The pedicle was twisted once and the cyst wall was engorged with dark blood. There was no normal ovarian tissue present. The other pelvic organs were normal. The cyst was removed in the usual manner by ligature of the pedicle. The appendix was found to be normal and was removed in routine manner.

When seen three months later the patient was very well and had had no recurrence of her symptoms.

Case II: Rupture of a Tarry Lutein Cyst with Intraperitoneal Hæmorrhage.

The patient, a married woman, aged thirty-five years, had a normal menstrual history, the periods occurring every twenty-eight days and lasting three days.

For the three months prior to observation she had noticed vague aching pain in the left iliac fossa, worse before each period. On the day of her admission to hospital, which was the last day of her last menstrual period, she was seized with sudden severe pain in the left iliac fossa, which doubled her up and made her vomit and feel faint. Six hours after its commencement the pain radiated over the hypogastrium.

Examination revealed a very pale, anxious woman, with a temperature of 98° F. and a pulse rate of 110 per minute. The lower part of the abdomen was distended and very tender, with pronounced rigidity in the left iliac fossa. Pelvic examination revealed no blood in the vagina. The cervix was firm and the os was closed. The uterus was small, firm and anteverted. The left fornix was filled with an exquisitely tender mass, movable apart from the uterus. The posterior fornix was ballooned into the vagina and was very tender.

A preoperative diagnosis of intraperitoneal hæmorrhage was made, and it was thought to be due to a ruptured ectopic gestation or a ruptured ovarian cyst.

Operation through a lower left paramedian incision revealed that the abdomen contained much blood clot and some fresh bright red blood. The left ovary was entirely replaced by a cyst, proved later to be a tarry lutein cyst. It was the size of an orange and had thick walls, and it was full of tarry fluid and recent blood clot. It had ruptured at one place, allowing the contents to escape into the abdominal cavity. There was much clot in the pouch of Douglas. There were no adhesions between the cyst and neighbouring viscera. The cyst entirely replaced the ovary and was removed in routine fashion. The appendix was found to be normal and appendicectomy was performed.

Recovery was uneventful, but the patient did not return for a follow-up investigation.

Case III: Rupture of a Tarry Lutein Cyst with Intraperitoneal Hæmorrhage.

The patient, a young woman, aged twenty years, had a normal menstrual history; the menses occurred every twenty-eight days and lasted four days. Her next menstrual period was due to commence within the next day or so.

She had had attacks of pain in the right iliac fossa for one year prior to observation. These attacks were not severe until the previous three weeks, during which they were of increasing intensity. They were always worse when they occurred in the premenstrual period. Three days before her admission to hospital the pain became very severe and gripping in character and made her vomit. The pain was first localized to the right iliac fossa, and after twenty-four hours radiated all over the lower part of the abdomen; after forty-eight hours severe epigastric pain occurred and the patient fainted.

Examination revealed a very pale, anxious girl, with a normal temperature and a pulse rate of 120 per minute. She was tender over the whole of the abdomen, and the lower part of the abdomen was held rigid. This rigidity was most pronounced in the right iliac fossa. Pelvic examination revealed tenderness in the right fornix, and no mass was present. The uterus was small, hard and anteverted. The cervix was firm. Tenderness was elicited when pressure was applied to the cervix. There was no free blood in the vagina.

A preoperative diagnosis of intraperitoneal hæmorrhage, probably from a ruptured *corpus luteum*, was made.

Operation was performed through a right lower paramedian incision and much free blood and recent clot were found in the abdomen and pelvis. There was a small ruptured cyst in the right ovary, and blood was slowly oozing from the rent in the cyst. There was much clot in the cyst, and when this was removed the wall of the cyst was seen to be thin and yellow. A little tarry thick fluid was present also. The cyst was later shown to be a tarry lutein cyst. The rest of the ovary was normal, save for the presence of some little follicular cysts. The other pelvic organs appeared to be normal. A wedge-shaped portion of ovary containing the cyst was excised, and hæmostasis was secured by fine mattress sutures. The appendix was found to be normal and was removed in routine fashion.

Recovery from the operation was uneventful. One year later the patient was quite well, except that she still had aching pain in the right iliac fossa, worse just before the menstrual periods.

Ætiology of Ovarian Hæmorrhage.

Forssner (1916) believed that all ovarian hæmorrhages were due to ovarian pregnancies, whilst Traugott (1926) thought that careful investigation would show that all examples were due to complete tubal abortions. These suppositions were disproved by Simon (1928) (*a*), who reported a series of 30 cases of ovarian hæmorrhage in none of which could histological evidence of chorionic villi be found.

The causation of these hæmorrhages has been ascribed to many ætiological factors, and the following summary is modified from those given by Stuckert (1930) and Sackett (1932).

1. General causes, such as acute infections, blood dyscrasias (Guillemin, 1936), chronic passive congestion, as in cardio-renal disease (Ruckstinat, 1932).

2. Local causes, (*a*) in the internal genital organs, such as the hyperæmia of coitus (Payne, 1933, Stuckert, 1930), local passive congestion due to pregnancy, tumour or torsion of the pedicle (Case I), pelvic inflammatory disease, coexistent tubal pregnancy (Israel, 1937) or trauma, as, for instance, a blow on the abdomen (Christopher, 1929), an operation on pelvic organs (Fergueson, 1912), attempted criminal abortion (Haddon, 1924); (*b*) in the ovary itself, as, for instance, the normal cyclic changes in the follicle and *corpus luteum*, chronic inflammation of the ovaries (Hirschfeld, 1935), sclerosis of the parenchyma or *tunica albuginea* [Simon, 1928 (*b*)], local endarteritis (Schumann, 1921), interference with follicular maturation and dehiscence and retrogression with cyclic changes, or local hyperæmia (Shaw, 1927).

It will thus be seen that there are many factors said to be involved in ovarian rupture; but in many cases, especially rupture of the Graafian follicle causing intraperitoneal hæmorrhage, no apparent cause can be found. Boggon and Wrigley (1931) ascribed all their 13 cases to mild trauma; but Israel (1937) could not elicit any history of trauma in any of his cases. There was no history of trauma in the three cases here reported.

Pathology.

It is convenient to divide these hæmorrhages into two classes: (*a*) those occurring in the apparently normal ovary, and (*b*) those occurring in an ovary the seat of pathological change.

Just after menstruation a considerable number of follicles commence to ripen; but usually only one reaches maturity and ovulates (Novak, 1936). Ovulation occurs from the twelfth to the sixteenth day before the next menstrual period in women with a twenty-eight to thirty day menstrual cycle, that is, approximately in the mid-period (Novak, 1930, Knaus, 1934).

Ovulation may be associated with bleeding into the *theca interna*, forming a Graafian follicle hæmatoma (Shaw, 1927), which may or may not rupture into the peritoneal cavity. It has also been shown that this bleeding may arise from rupture of a small vein near the stigma (Picaud, 1936), which may lead to slight or severe intraperitoneal hæmorrhage. This slight escape may occur normally in women, and is the cause of mid-menstrual pain or *"Mittelschmerz"*. This was confirmed by Wharton and Henrikson (1936), who operated on thirty patients suffering from mid-menstrual pain. Operation was performed at the mid-period, and evidence of ovulation with free blood in the peritoneal cavity was found in nine of these patients.

After ovulation the *corpus luteum* is formed, and normally there is no hæmorrhage into this body until it commences to retrogress just prior to the onset of menstruation (Eden and Lockyer, 1935). Pathological hæmorrhage, however, may occur into it at any time and may cause intraperitoneal hæmorrhage.

Those follicles which do not ovulate normally form the *corpora atretica*, which eventually collapse, each forming the *corpus candicans*. In some cases, however, the *corpus atreticum* does not collapse but becomes distended and enlarged to form a follicular cyst. This cyst may be the seat of hæmorrhage and rupture, as in Case I here reported, in which torsion of the pedicle occurred.

On the other hand, the *corpus atreticum* may form one of the lutein cysts, either the granulosa-lutein or the theca-lutein cyst, which were described by Shaw (1927). Normally the *theca interna* of

an atretic follicle proliferates, whilst the granulosa-cell layer degenerates with the ovum. If the former layer is the seat of luteinization a theca-lutein cyst is formed. At times the granulosa layer does not disappear, but becomes luteinized with the thecal layer, and so a granulosa-lutein cyst is formed.

These cysts are usually single, but may be multiple, forming the so-called compound lutein cysts seen especially in some cases of hydatid mole. Hæmorrhage may ocucr into the lumen of these cysts and the blood in them undergoes a peculiar form of liquefaction, so that the contents remain liquid and have a tarry appearance; this was the reason that Shaw (1927) named them tarry theca-lutein and tarry granulosa-lutein cysts respectively. If hæmorrhage is severe these cysts will rupture and spill their contents into the peritoneal cavity, as in two of the cases here reported.

There is a third type of blood cyst of the *corpus luteum*, the tarry *corpus luteum* cyst, which, however, does not often rupture into the abdominal cavity, because it is adherent to surrounding organs. It arises by repeated small bleedings into a normal *corpus luteum*, forming a thick-walled cyst, which, when examined microscopically, shows the convolutions of normal luteal cells.

The types of ovarian rupture with intraperitoneal hæmorrhage relevant to this paper may now be summarized as being due to (*a*) hæmorrhage into the Graafian follicle or *corpus luteum* of the normal ovary or (*b*) hæmorrhage into a follicular cyst or a tarry lutein cyst (of which there are three types) of the abnormal ovary.

The fluid present in the abdomen varies from serosangineous, said to be most common in ruptured Graafian follicles, or frank blood (most common in *corpus luteum* rupture) to tarry and chocolate-like material when a tarry lutein cyst ruptures, and the quantity varies from a spoonful to two or more pints (Israel, 1937).

If ruptured cysts are found at operation they are usually difficult to diagnose macroscopically, because although the lining of the hæmatoma may appear yellowish, this may be due to phagocytosed blood pigment or lutein cells or even to lipoid deposit (Teacher, 1935).

Dual lesions may occur with these hæmorrhages, and they may be associated with a hæmatosalpinx (Greenhill, 1930), with an ectopic gestation (Novak, 1937), or with an acute appendicitis (Hoyt and Meigs, 1936).

The relative incidence of the types of hæmorrhage has been investigated by J. Berecz (1927), who, in examination of 1,058 ovaries removed at operation over a period of six years at the Women's Hospital, Budapest, found that in 108 (10%) hæmorrhage, either intraovarian or intraperitoneal, had occurred. Of these, in 13 the hæmorrhage was follicular, in 33 the hæmorrhage was into follicular cysts, in 25 the hæmorrhage was into a *corpus luteum*, in 29 the bleeding took place into *corpus luteum* cysts, and in 8 it was interstitial.

Age Incidence.

These hæmorrhages are found to occur mostly in adult women during the reproductive period.

In the series of 108 ovarian hæmorrhages reported by Berecz (1927) the ages ranged from eighteen to forty-nine years, and were mostly between thirty-one and forty years. Masson and Phillips (1933), in a series of 11 cases, found that 10 occurred between the ages of twenty-two and thirty-five years. Hoyt and Meigs (1936) reported 58 cases, of which 30 occurred between the ages of fifteen and twenty years, and 14 between the ages of twenty-one and twenty-five years.

One of the patients reported by Masson and Phillips (1933) was aged sixty-two years, and the youngest in the literature was a girl, aged twelve years, who had a ruptured follicular cyst with intraperitoneal hæmorrhage (King and Howe, 1936).

The low incidence of bleeding in children agrees with the fact reported by Steel (1931) that 97% of ovarian cysts occur in adults, and also with the circumstance that the hæmorrhages occur into structures actively concerned with reproduction or their pathological derivatives.

Symptomatology.

The correct diagnosis of this entity is established far more on a proper interpretation of the symptomatology than on the physical signs themselves (Sackett, 1932).

A previous history of attacks of abdominal pain can often be elicited. Hoyt and Meigs (1936) found that 20 out of 58 patients suffering from this illness had had occasional abdominal discomfort for varying times prior to the rupture of the ovary. Eight patients had suffered several attacks of actual abdominal pain before the final acute attack.

In cases of Graafian follicle rupture there may be a history of recurrent intermenstrual pain, the so-called *"Mittelschmerz"* (Wharton and Henrikson, 1936).

It is important to establish the relationship of the time of rupture of the ovary to the menstrual cycle, as by this means one may distinguish Graafian follicle rupture from *corpus luteum* rupture. Should hæmorrhage occur into a Graafian follicle it does so at the time of ovulation, that is, about the middle of the menstrual cycle (Wharton and Henrikson, 1936), whereas *corpus luteum* hæmorrhage occurs later in the menstrual cycle (Israel, 1937). In a series of 85 ovaries removed at operation by Novak [1917 (*b*)] *corpus luteum* hæmorrhage occurred from the sixteenth to the twenty-fifth day of the menstrual cycle.

It used to be thought that menstrual irregularities did not occur prior to ovarian rupture, and this fact has been used as a diagnostic point in differentiating this entity from ruptured ectopic gestation (Israel, 1937); but Rudolph (1932) reported a case of ruptured *corpus luteum* cyst in which irregular vaginal bleeding had occurred for fourteen days

prior to the onset of the acute attack. Ehrhardt and Kramann (1936) reported a case of ruptured luteal cyst in which the patient missed a menstrual period prior to the rupture.

The symptoms of rupture are extremely protean in their manifestations. The attack may be of slow or sudden onset, and it may be accompanied by vomiting or nausea.

The pain is usually first localized to one or other iliac fossa, according to the side of the lesion, and it appears more often in the right iliac fossa, the right ovary being the more commonly affected (Masson and Phillips, 1933).

It is also known that rupture of a left ovarian cyst may give rise to initial right-sided pain (Israel, 1937).

After the initial attack symptoms will vary with the amount of shock or hæmorrhage present, and in severe hæmorrhage the abdominal symptoms will become generalized. Israel (1937) has pointed out that bleeding is more severe in *corpus luteum* rupture than in Graafian follicle rupture because of the premenstrual hyperæmia of the ovaries.

Signs.

The signs may vary considerably, and there is no pathognomonic sign. At first there are tenderness and rigidity of variable degree in one or other iliac fossa. The patient may be in a state of severe shock, but often appears to be remarkably well, even though pronounced tenderness and board-like rigidity of the abdomen may be present. As the hæmorrhage increases and spreads, the abdomen becomes distended and the rigidity becomes generalized. In a case of massive hæmorrhage reported by Olsen (1931) shifting dulness was elicited in the flanks. At operation one litre of blood was removed. This sign is very rare.

The temperature may be subnormal, normal or raised to 101° F., so that little significance can be attached to it, and the pulse rate is variable, depending on the amount of shock and hæmorrhage (Hoyt and Meigs, 1936).

Pelvic examination reveals one important negative finding in these cases, and that is the absence of blood in the vagina [Simon, 1928 (*a*)]. The cervix is firm and the uterus of normal size (Jones, 1936). Palpation of the fornices may reveal only tenderness, as in cases of ruptured Graafian follicle or normal *corpus luteum*, or a mass, usually freely movable and separate from the uterus, as in cases of ruptured follicular or lutein cysts. The size of the mass will vary according to the size of the original cyst and the amount of blood clot around it.

Diagnosis.

On account of the varied manifestations of this syndrome, diagnosis may be very difficult. The clinical picture varies from one in which the patient has pain, rigidity and tenderness localized to one or other iliac fossa, accompanied by shock of varying degree, to the picture of a severe intraperitoneal hæmorrhage, so that many other acute abdominal conditions may have to be considered.

In Simon's 27 cases [1928 (*a*)] a preoperative diagnosis of acute appendicitis was made in 21 cases, and of ectopic gestation in the remaining cases. Boggon and Wrigley (1931) reported 13 cases, in all of which acute appendicitis was diagnosed prior to operation. Block (1930) states that prior to 1930 no case had been reported in the literature in which the diagnosis was made before operation, the diagnosis usually being acute appendicitis or ectopic gestation. Bowen (1930) reports a case of ruptured ovarian cyst with intraperitoneal hæmorrhage simulating acute pancreatitis and diaphragmatic pleurisy. In the series published by Hoyt and Meigs (1936) ruptured Graafian follicle was correctly diagnosed in three cases before operation, and ruptured *corpus luteum* in fourteen cases. In 33 of the others the diagnosis was acute appendicitis.

As a rule, when the symptoms and signs are localized to the right iliac fossa a diagnosis of acute appendicitis is made, unless a mass is present in the fornix, when ectopic gestation is the more frequent mistake. Symptoms and signs referable to the left iliac fossa, with or without a mass, may lead to a diagnosis of ectopic gestation. In the more severe cases the usual diagnosis is intraperitoneal hæmorrhage due to a ruptured ectopic gestation.

In regard to the severe cases, Jones (1936) states that if a patient presents all the signs of a ruptured ectopic gestation, but the classical adnexal mass is absent, then one should consider a ruptured Graafian follicle or *corpus luteum*. However, an adnexal mass may be present owing to the hæmatoma of the ovary, and, although its presence may exclude acute appendicitis, it will not exclude ovarian rupture on its own account. If an adnexal mass is absent it may be impossible to differentiate acute appendicitis from a right-sided ovarian rupture by the physical findings alone.

The firm cervix and small uterus will help to exclude ectopic gestation, in which the uterus is a little enlarged and the cervix slightly softened. The presence of blood in the vagina will suggest an ectopic gestation.

The temperature may be raised and leucocytosis may be present, both in acute appendicitis and in intraperitoneal hæmorrhage. Leucocytosis is almost always present in intraperitoneal hæmorrhage due to any cause (Grier, 1937), and in the cases due to ovarian hæmorrhage reported by Sackett (1932) the leucocytes averaged 13,000 per cubic millimetre, with a range from 7,200 to 22,000 per cubic millimetre.

The blood sedimentation rate is raised in intraperitoneal hæmorrhage (Tenney, 1936) and is normal in acute appendicitis (Lesser and Goldberger, 1935); but it does not help when one wishes to differentiate between the causes of the intraperitoneal hæmorrhage.

If the case is a mild one and urgent operation is not needed, a curettage will reveal the decidual cells of pregnancy with the absence of villi, so establishing the diagnosis of ectopic gestation in a

patient who would perhaps otherwise be treated expectantly as a mild case of Graafian follicle rupture.

The Aschheim-Zondek test is a diagnostic point in favour of ectopic gestation if the result is positive, although Ehrhardt and Kramann (1936) report a case of *corpus luteum* cyst in which the result of the Aschheim-Zondek test was positive, although the patient was not pregnant. If the result of the Aschheim-Zondek test is negative, the diagnosis of ectopic gestation cannot be excluded on this account alone, because there is 32% error in the results of the test in cases of ectopic gestation (Goldberger, Salmon and Frank, 1934).

I may summarize this discussion on the difficulty of diagnosis by stating with Kretzschmar and Arnell (1936) that ovarian rupture with intraperitoneal hæmorrhage should be suspected in any woman presenting an acute lower abdominal emergency during the latter half of the menstrual cycle.

Prognosis.

The prognosis of ovarian rupture with intraperitoneal hæmorrhage is good, but varies with the degree of hæmorrhage. Mild cases are often unrecognized and are of minor gravity. Johnson (1930), in a review of 77 cases, reports six deaths.

Sackett (1932) followed up 18 of his 26 patients for periods varying from one month to three years and found a recurrence of pain in two cases, one of the patients having had a similar acute attack, which this time cleared up by conservative treatment. Menstrual disorders were relieved in six cases; two patients had normal labours after the operation and a third had a miscarriage.

As regards the liability of recurrence, Cotte, discussing a paper by Convert (1936), said that no case of recurrence of ovarian rupture with intraperitoneal hæmorrhage had been published; but four months later the first case of recurrence was reported by A. Guillemin (1936), who had to operate twice on one of his patients, the second rupture involving the other ovary.

Treatment.

Each case must be treated on its own merits. If the diagnosis is certain, in mild cases of ruptured Graafian follicle conservative measures may be used; but if there is any doubt in the diagnosis, or if a mass is present or bleeding appears to be occurring, then laparotomy must be performed.

If the patient is suffering severely from shock or has lost much blood into the peritoneal cavity, one must first improve the general condition by means of the intravenous injection of gum saline solution or transfusions of citrated blood, and then operate as soon as the patient's condition allows. If no facilities for transfusion are present, or if suitable donors are unavailable, autotransfusion of the patient's blood from the peritoneal cavity may be used, providing the blood is fresh.

With regard to the ovaries, one should be as conservative as possible. Block (1930) stated that prior to 1930 he found that 60% of affected ovaries reported in the literature had been totally removed, and he urged more conservative treatment.

If there is a small cyst or hæmatoma in an ovary which appears otherwise normal, then removal of the cyst by wedge resection of the ovary is all that is needed.

If there is only a bleeding point present, as in certain Graafian follicle hæmorrhages, no ovarian tissue need be removed. The bleeding point should be sutured by a fine mattress stitch passed on a small needle (Israel, 1937).

Sometimes, in spite of all measures, an ovary will not stop bleeding, even in simple Graafian follicle rupture; the ovary then has to be completely removed, as in the case reported by Guillemin (1936).

Summary.

1. Three cases of ovarian rupture with intraperitoneal hæmorrhage are reported.

2. The ætiology, pathology, symptomatology, signs, diagnosis, prognosis and treatment of this condition are discussed.

3. The difficulty of diagnosis and the need of a careful history are stressed.

4. Conservative treatment of the ovary, where possible, is advocated.

5. References to the relevant literature are given.

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Reports of Cases.

NON-SURGICAL (NATURAL) SEPARATION OF THE GALL-BLADDER.

By Alan E. Lee, M.D. (Melbourne), F.R.C.S., *Brisbane.*

Clinical Record.

Mrs. T.E., aged sixty-seven years, presented herself at the Brisbane Clinic on April 19, 1938.

At the age of sixteen she had suffered an attack of painless jaundice. She then remained well till her first baby, now aged thirty-two years, was two years old. At that time she developed very severe abdominal pain, with soreness and vomiting. She was in hospital for nine weeks and was very ill.

Living as she did in a town in western Queensland, and not caring to trust herself to the surgical attentions of the single available medical man, she treated herself with hot-water bottles till the skin blistered. After recovery from this attack she had no further trouble till twelve years ago, when she had a series of attacks of very severe abdominal colic, with much soreness. She was at that time in another western town, and after treatment with large doses of salad oil the condition subsided in three weeks.

She then remained well till eight months ago, when she suffered from dyspeptic symptoms similar to those to be described later. She was treated on this occasion at a hospital in Brisbane. X ray examination at this time revealed a large gall-stone; but because of the long intervals between previous attacks no operation was advised.

At her first consultation at the Brisbane Clinic her chief complaint was of a severe stomatitis induced by the mistaken swallowing of twenty-five grains of subchloride of mercury five days before. This rapidly responded to treatment. She then volunteered the information that she had suffered for some months from severe flatulent dyspepsia. The discomfort often increased to such an extent that vomiting would occur, usually about thirty minutes after a meal, with relief.

During the following month the vomiting became more persistent, and on May 10, 1938, it was noted that during the past seven days, at about 7 p.m., fullness and then vomiting had occurred; the vomitus frequently contained food ingested ten hours before.

X ray investigation after a barium meal was now carried out, and gross obstructive gastric retention was found to be present. The obstruction was in the duodenum, and it was noted that the obstructed duodenal cap was in intimate relation to a calcified shadow resembling a gall-stone.

It was suggested that the duodenal obstruction was due to pericholecystic adhesions.

She was given a series of gastric lavages and a bland diet was given. The radiological examination was repeated and the following report was rendered:

> There is a large J-shaped atonic stomach; it is very difficult to force the meal through the pylorus, when the duodenum appears as a faint mucosal pattern. The nature of the duodenal obstruction is still not obvious, but is very definite.

Operation was undertaken on June 15, 1938. Under ether anæsthesia a right paramedian upper abdominal incision exposed a dense mass of adhesions between the inferior margin of the liver and the duodenum. After some dissection a finger could be passed under a band of tissue extending from the under-surface of the liver to the duodenum. This was divided between clamps and sutured. It appeared to contain no lumen. On further examination of the duodenum a hard regular mass could be felt within it, possessing limited mobility. The peritoneal surface of the duodenum was intact over this mass. The limited mobility suggested a polypus; but when the anterior wall of the duodenum was incised over the mass a large spherical gall-stone was immediately disclosed. After extraction of the stone the resulting cavity was seen to have no communication with the duodenal canal. When the incision was lengthened the duodenum could be opened on either side of this cavity, and then the inner wall was similarly incised. This wall contained mucosa on each aspect, but on macroscopic examination appeared to embrace no other tissues.

The duodenal obstruction was now quite obvious, since the lumen of the gut was almost blocked by this mass. The longitudinal duodenal incision was converted into a transverse one and closed in layers.

Further attention was now paid to the lower surface of the liver, and the stump of the gall-bladder, about one inch long, could be traced through the cystic duct to the common duct. Its removal was quite a simple matter; and when it was opened it was found to contain no further stones. A drain was placed in Morison's pouch and the remainder of the parietal incision was closed in layers.

During convalescence a rather severe infection of the abdominal incision developed and much foul-smelling pus of the typical *Bacillus coli* type was evacuated. The wound eventually healed; but some weeks later redness and induration were again present around the lower end of the incision and much pus was later discharged.

After the patient went home there was a repetition of the process, and on this occasion pain was experienced in the right shoulder tip.

An X ray examination at this time revealed elevation and fixity of the diaphragm on this side.

A sinus was now present at the lower end of the abdominal incision, and through this it was possible to pass a medium-sized catheter up to such a position that its further progress evoked further pain in the shoulder tip.

The injection of a radio-opaque fluid disclosed that the subphrenic abscess was of very limited extent. It was decided to allow prolonged drainage to occur through the catheter. The catheter was kept in place for nearly five months, by which time all discharge except that due to the presence of the foreign material had ceased. It was then withdrawn, and the sinus rapidly closed and has remained closed.

The patient's general condition improved steadily, until at the present time she is in better health than for many years past. She is doing her own housework and feels she has a renewed lease of life.

Although a microscopic examination of the partition between the gall-bladder and the duodenal canal was not made, the double layer of mucosa made it fairly obvious that the cavity was nothing less than the fundus of the gall-bladder; not only had it achieved a complete separation from the remainder of its body, but a complete restitution of the duodenal peritoneum had occurred over its wound of entry. Nature in fact, in the course of one of the earlier attacks of gangrenous cholecystitis, had succeeded in amputating the gall-bladder and in incorporating it, together with its contained stone, within the duodenal lumen.

Comment.

This migration of gall-bladder fundus as well as stone is, so far as the writer knows, unique, though of course many reports of the passage of both gall-bladder stones and also common duct stones into the most bizarre situations, as the result of pressure and necrosis, are on record.

Reviews.

SURGICAL ANATOMY.

Two years after the second edition it was found necessary to bring forth yet another edition of a "Synopsis of Surgical Anatomy", by McGregor.[1] This speaks for itself. The book has won instant popularity, filling as it does a great need and setting forth its contents in an attractive and interesting manner.

The object of the book is to provide a short synopsis of the surgical importance of anatomy and embryology; it is full of excellent original illustrations and figures, and has an exceptionally full index. This work is a boon to surgeon and student alike, as well as being invaluable to those reading for a higher surgical degree. The fourth edition differs from the previous one only in minor alterations in the text following numerous suggestions made to the author.

SURGICAL TECHNIQUE IN OTO-RHINO-LARYNGOLOGY.

DR. GEORGES PORTMANN, of Bordeaux, has such an eminent position amongst world oto-rhino-laryngologists that we approached his publication "A Treatise on Surgical Technique of Otorhinolaryngology" with great expectations.[2] Though we regret to state that our expectations are not realized, Dr. Portmann's fame is such that his publication deserves to receive more serious consideration than those from men of a lesser standing.

Dr. Portmann states that in this work he has attempted to depart from the consecrated habits of time and the authority of his predecessors by presenting only those procedures which he follows in his services at the Tondu Hospital and which he teaches in the otolaryngological clinic at the University of Bordeaux. He desires that his book should be a "spoken one, a repetition of what his students hear him say each day in the operating room". We wish that Dr. Portmann had not followed this plan, for we think that, had he not done so, his work would have been of far greater value to all those interested in the speciality. The book does not cover the whole of the speciality, and on the other hand it includes many operations which today are not performed, at least by surgeons in the British Empire. He has gone to extremes in following his method of presentation. His repetition of

[1] "A Synopsis of Surgical Anatomy", by A. L. McGregor, M.Ch., F.R.C.S., with a foreword by H. J. Stiles, K.B.E., F.R.C.S.; Fourth Edition; 1939. Bristol: John Wright and Sons Limited. Crown 8vo, pp. 679, with 648 figures. Price: 17s. 6d. net.

[2] "A Treatise on the Surgical Technique of Otorhinolaryngology", by G. Portmann, with the collaboration of H. Retrouvey, J. Despons, P. Leduc and G. Martinaud; translated by P. Viole, M.D.; 1939. London: Baillière, Tindall and Cox. Imperial 8vo, pp. 685, with 474 illustrations and 2 coloured plates. Price: 57s. net.

elementary details is far too frequent and becomes annoying to the intelligent reader. However, he does insist that the first qualification of the specialist in oto-rhino-laryngology is that he be a surgeon. We are given photographs of operating rooms, of operating tables, of a patient lying in bed and even of the empty bed itself. Elementary details are described, such as the surgeon's operating uniform, even to the linen leggings he should wear, the preparation of his hands in "water without any added antiseptic solution", and we are told that this scrubbing process should be performed two or three times or from eight to ten minutes followed by a rinse in 90% alcohol. Also all sorts of details concerning the preparation of the patient, instruments, receptacles for soiled material, lighting, suction *et cetera*, are all minutely described. Directions that "the gouge should be held between the thumb and first two fingers of the left hand" and that "the Klaar lamp is to be used" are repeated so many times that we unconsciously ask whether the left-handed surgeon has any other choice of method of holding the gouge, and must he use the Klaar lamp.

Many illustrations of instruments are practically reproductions of the same set; for instance, in the sections on surgery of the mastoid bone there are four full-page illustrations of instruments that vary only in the slightest detail.

Incisions are repeated many times, and likewise details concerning first and second assistants. In regard to illustrations of operations, these are profuse; and in dealing with resection of the internal jugular vein, which occupies thirty-three pages in all, the author presents twenty-eight large-sized illustrations, many of which are identical, except for some minor point. In fact, illustration has been carried to a point of absurdity. The illustrations in the main show the patient in the horizontal position rather than in the vertical, as is usually the practice; but the author is not consistent and the reader becomes rather bewildered by seeing illustrations in some instances in the horizontal position, in others in the vertical and in others actually upside down. The author naturally has tried to present his illustrations as they appear to the operating surgeon, but in this he has not been successful.

There is a section on resection of the inferior turbinate bone, an operation which is seldom performed by British surgeons today. The removal of the middle turbinate bones is advised by evulsion with Luc's forceps, but we should prefer their removal by clean cutting punch forceps. The removal of septal spurs by chisel, spoke-shave and cautery is also described, whereas British surgeons prefer to deal with such deformities in less crude ways. There is a small chapter on removal of nasal polypi; since, however, we now attack the site of the origin of the polypi rather than the polypi themselves, we think this chapter hardly logical. Likewise in the section dealing with radical operation upon the maxillary sinus, mention is made of the curettage of the cavity, whereas the method of stripping out the mucosal lining in its entirety is mentioned only as an incidental possibility. There is no mention of the transantral approach to the upper group of nasal accessory sinuses, and the frontal sinus operation is performed by the removal of its anterior wall. Operations upon the frontal, ethmoidal and sphenoidal sinuses by the paranasal approach are not mentioned. The only method described for decompression of the labyrinth is the author's own operation of tapping the *saccus endolymphaticus*; but in this instance, where illustrations of the minute detail of the deep structures would be most valuable, the author has not shown his usual generosity. We should like to have seen minute descriptions of the operations upon the labyrinth for the relief of deafness as practised by the Bordeaux school. We are greatly disappointed in consequence.

The operation for excision of the upper jaw has been given a section; but this dramatic operation is not considered justifiable by British surgeons nowadays, the disease being exposed by them by removal of the alveolar process and portion of the palate, and the growth destroyed by diathermy followed by radiation.

Coming from such a prominent French oto-rhino-laryngologist, the work must be accepted as typically French in outlook. The book on the whole is disappointing. Even a mere tiro in the speciality would become very tired of the repetition of the many elementary details enumerated. The book could with advantage have been compressed into a quarter of its size. The "American" edition has not been improved by translation, for in places it obviously shows that the translator has not an understanding of English sufficient for the task. Had this work appeared as an atlas on surgical procedure we should have praised it, for there is much in it which is highly commendable. It is very regrettable that this world leader in the speciality should have been persuaded to produce this "American" edition, and we venture to suggest that it will be bought merely as a curiosity.

ABNORMAL OBSTETRICS.

One of the aims of this new book, "The Abnormal in Obstetrics", by Berkeley, Bonney and MacLeod, is to assist practitioners in preparing for one of the higher examinations in obstetrics.[1] It is broad enough to be a book of reference, and contains accounts of many rare conditions which most of us meet only in the heat of a *vivâ voce* examination. Such disorders as aneurysm of the renal artery, avulsion of the colic mucosa, hydrophobia and sutika are discussed in relation to their association with pregnancy; and so if we encounter an uncommon case this is the first book to consult. It is modern in its outlook and yet conservative in its precept. Thus Caldwell and Molloy's classification of contracted pelvis is recommended, and trial labour is preferred to induction of premature labour in *primigravidæ* with a contracted pelvis. The authors, apparently realizing what scant notice is taken of the new-born baby in most obstetrical text-books, here give him his due and have dedicated over a tenth of the book to him alone. The section on the treatment of *asphyxia neonatorum* is excellent, and the authors are strongly in favour of the intratracheal use of the catheter, the administration of carbon dioxide and lobeline injections into the umbilical vein; they condemn "artificial respiration of any kind in the sense of moving the chest".

Ante partum hæmorrhage is soundly discussed and the authors reflect the general trend in British obstetrical practice in condemning vaginal plugging, stating that in accidental hæmorrhage "the only reason we can see for plugging the vagina is that for the time being it prevents the doctor from being tempted to take other measures for delivering the child, so that there will be a greater chance of the patient recovering from her shock".

The section on puerperal sepsis is well designed and includes a description of the methods of investigation and general management.

Like many first editions, this book badly needs revision; and we confidently hope that in subsequent editions the performance of Cæsarean section will not be considered in the treatment of a patient with an abscess of Bartholin's gland in order to save the sight of the offspring. We are pleased to see a bibliography appended, and feel that this should be included in all books written for post-graduates. The value of the bibliography would be further increased if the titles of the articles were also listed. This book has a place of its own amongst obstetrical literature, and we know of no single volume of such scope. It should have a space on the book-shelf of every obstetrical specialist and of every practitioner with a large obstetrical practice; given this space, it will, we are sure, never need dusting.

[1] "The Abnormal in Obstetrics", by C. Berkeley, M.A., M.C., M.D., F.R.C.P., F.R.C.S., M.M.S.A., F.C.O.G.; V. Bonney, M.S., M.D., B.Sc., F.R.C.S., F.R.A.C.S., M.R.C.P., and D. MacLeod, M.S., M.B., F.R.C.S., F.R.C.P., M.C.O.G.; 1938. London: Edward Arnold and Company Limited. Demy 8vo, pp. 533. Price: 18s. net.

The Medical Journal of Australia

SATURDAY, OCTOBER 21, 1939.

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DENTAL CARIES.

During recent years much has been written on dental caries and the public has been told that the best preventive is a carefully chosen and well-balanced diet. Quite recently it was stated in a broadcast talk that "if an apple a day keeps the doctor away, it takes three apples a day to keep the dentist away". People were urged to finish every meal by eating an apple. This is sound enough advice, but it by no means covers the whole subject, for the causation of dental caries is still obscure, and though certain facts have emerged from the mass of evidence, many of the data are conflicting and much more work remains to be done. Dental caries has been discussed in these pages on several occasions. In the issue of July 29, 1933, we published a special abstract of a review of the subject by Teodore Rosebury which appeared in *Archives of Pathology* of February, 1933; and on April 21, 1934, attention was drawn to a special report on diet and the teeth from the pen of May Mellanby, published by the Medical Research Council of Great Britain. Mrs. Mellanby had devoted seventeen years to experimental study, and she showed that diet had a profound influence on the resistance of the tooth. The appearance of another review, this time by John A. Marshall, makes it appropriate to refer once more to dental caries.[1]

Marshall discusses the ætiological factors under an alphabetical arrangement: A, anatomical; B, bacteriological; C, chemical; D, dietary; E, endocrine; F, failure in mouth hygiene; H, heredity—a useful mnemonic. It will be possible to refer merely to the most important points in Marshall's presentation; those who have a special interest in the subject are advised to study his article, for it is full of important information, carefully presented and accompanied by sound argument. Marshall refers first of all to hypoplastic teeth and points out that many writers have confirmed the clinical and laboratory observations that there is scarcely a tooth in man or lower animals which does not present areas of incomplete formation. It has been suggested by Entin that enamel and dentine possess properties of semipermeable membrane towards solutions of salts and dyes. In these circumstances hypoplastic teeth are more permeable than so-called normal teeth, in which calcification is dense and nearly completed. Caries begins in a permeable crevice or "fault" area. Marshall sets out the diverse opinions that have been expressed on the anatomical factors in the ætiology of caries, but he does not attempt the colossal task of reconciling them in one hypothesis. He points out, however, that an analysis of the facts makes it increasingly evident that structural weaknesses in enamel and dentine occur so frequently and have been produced with such ease by experimental means that the relative density of teeth may be the controlling factor in immunity and susceptibility to caries. The former conception of hypoplasia is not only inadequate, but in some respects wrong. It is not true that a tooth once erupted does not change in degree of calcification. Dental density in man increases with age. Moreover, both enamel and dentine possess properties of permeability provided the dental pulp retains its vitality and is neither infected nor inflamed by trauma. The passage of substances through the dental tissue is controlled by the density or degree of calcification in each tooth—"the less dense the greater the permeability". If the mineral intake is

[1] *Physiological Reviews*, July, 1939.

unbalanced or if the nutritional factors become inadequate at any period from fœtal life to twenty years of age, or if the individual is affected by an exanthem, dental hypoplasia of corresponding degree will be produced. In discussing the bacteriological aspect, Marshall points out that there are two opposite views. One is that the type of oral flora is the same in carious and non-carious mouths; the other, that aciduric organisms predominate in caries. He mentions the theory advanced by Miller, but does not state it. (Readers will find a short discussion of it in our abstract of Rosebury's article of 1933.) Miller postulated: (*a*) the retention of suitable carbohydrate food particles at certain sites on the tooth; (*b*) their decomposition by bacterial fermentation; (*c*) the local formation of organic acids, chiefly lactic, in contact with enamel; (*d*) the subsequent dissolution of enamel. Rosebury stated that Miller's theory provided the most satisfactory working hypothesis of the mechanism of the onset of caries. Marshall states that the theories of Miller seem always to be the starting point, but in some instances unfortunately the end point as well. Dobbs was able to show that mucin plaques were more permeable to dextrose solutions than to salivary buffers. It has also been suggested that acids other than lactic acid are produced as degradation products of carbohydrates. Hansen, Fosdick and Epple have extended and confirmed their preliminary work on the formation of reducing sugars from soluble starch. In the initial stages of caries *Bacillus acidophilus* is incapable of exerting any decalcifying action on powdered enamel. However, both in the initial and in the well-developed lesion, when *Bacillus acidophilus* is grown in symbiosis with *Bacillus acrogenes* or with *Saccharomyces cerevisiæ*, decalcification readily proceeds. Marshall thinks that the work of Hansen, Fosdick and Epple may serve to reconcile the opposing views regarding the flora of the mouth. These considerations lead naturally to discussion of chemical factors as evidenced in the saliva. Marshall draws attention to what he calls the glaring disagreement in results of the chemical examination of saliva; and we must leave this section of the subject with the statement that until standard methods of collecting salivary samples can be devised and adhered to by workers in all laboratories, the progress in this direction will be slow and barren of results. In regard to diet in relation to caries we need do little more than refer to the work of Mrs. Mellanby. Marshall states that some of her theories have been received coldly; but he uses certain of her findings to substantiate his view of the close parallelism of hypoplasia with caries. He draws attention to apparent contradictions in some of the work that has been reported, but this must not be discussed for reasons of space. One important statement should be emphasized. Marshall argues that the present situation in the epidemiology of human dental caries may be "the indirect result of deficient diets and particularly those classified by McCollum as 'borderline'". He finds support for this view in the fact that lesions resembling caries can be produced experimentally in animals maintained on deficient diets for relatively long periods, and that with second or third generation animals so controlled this result may be more easily obtained. He makes the sage suggestion that the human race may be suffering today from dietary insufficiencies of former generations. After a short discussion on the endocrines in relation to caries, Marshall points out that neither the physiology nor the pathological physiology of the endocrines is fully understood, and that until further facts can be discovered progress in this phase of ætiology will be uncertain. Failure of hygiene is the last factor to be considered. (Heredity has already been mentioned.) In this section Marshall includes repair of caries as well as its prevention. He refers to Suk's statement that races with the worst teeth do the most tooth brushing and mouth washing, and adds: "He could have done better if he had added that these same races are nearer to dietary insufficiencies than other races." The public which is bombarded by extravagant advertisements in the daily Press might do well to note also that: "The role of dentifrices, tooth pastes, mouth washes, deodorants and in general all preparations or solutions either of true or alleged antiseptic value is insignificant in therapy of caries."

This short account of Marshall's review shows what we set out to prove—that much has already

been discovered but that more remains to be learned. Many of the facts might well be broadcast among the people of this country, who should be taught not only what has been made possible in this prevention of dental caries, but also the value of preventive dentistry. In the past many Australians who prided themselves that undernutrition was almost unknown in the Commonwealth, were surprised at the revelations of the survey recently made. Further light might be thrown on the dental caries problem in this country if a complete investigation of all staple foodstuffs were made. We must be quite certain that our well-balanced diet contains all the factors necessary for the normal development of the teeth and for the growth and development of the body as a whole.

Current Comment.

A STUDY OF ALCOHOLISM.

From Boston, United States of America, there comes the report of an interesting study of alcoholism made at the Haymarket Square Relief Station, a branch of the Boston City Hospital.[1] This study, which is reported in six separate articles, has been made by Merrill Moore and M. Geneva Gray, associate in psychiatry and research fellow in neurology, respectively, at Harvard Medical School. Between 1927 and 1937, 3,730 alcoholic patients were treated in the out-patient department at the relief station and 6,556 were admitted to the wards, a total of 10,286 persons. Of the 3,730 alcoholic out-patients, 3,555 were men and 175 were women; of those admitted to the wards, 6,186 were men and 370 women. In the out-patient group men with alcoholism represented 1·8% and women 0·2% of all patients treated for the ten-year period. Alcoholic men constituted 33·6% of all male in-patients, and women with alcoholism 13·5% of all female in-patients. Alcoholic out-patients of both sexes made up 1·3% of all out-patients, and alcoholic in-patients of both sexes made up 31·0% of all in-patients. Alcoholic patients of each sex compared with all patients admitted represented 4·4% of the men and 0·6% of the women. Most of the in-patients "required care" for one day or less; the maximum stay of any alcoholic patient was 26 days. The average annual cost of the treatment of alcoholic out-patients was 868·64 dollars, and that of the treatment of alcoholic in-patients was 3,790·68 dollars, a total average daily cost of 4,659·32 dollars. This sum represented 6% of the total expenditure for the relief station.

The articles in this series do not all deal with the same period of time. That dealing with the conditions of all alcoholic patients treated at the relief station covers the period 1923-1938. During this period 16,054 alcoholic patients were treated, 94·6% being men and 5·4% women. It is important to note that after the repeal of the prohibition law there was a considerable increase in the number of women who required hospital treatment—the percentage rose from 2·3 in 1926 to 9·2 in 1936. According to decades, the largest number of patients (26·2%) were in the forty to fifty age group. In the thirty to forty group the percentage was 25·1, and in the fifty to sixty group it was 17·8. Two patients were under nine years of age and both were Italian boys who had tapped the family wine barrel. The occupations were not always recorded, but we read that 4,653 men were labourers; 2,746 men and 477 women were unskilled workers; 1,247 men and 13 women were semi-skilled workers; 381 men and three women were office workers above the level of clerks; there were 107 professional men and 11 professional women. Those discharged unconditionally numbered 7,764; 5,501 were returned to police custody; 1,607 were transferred to the main hospital and 100 to other hospitals; 761 were discharged at their own request and against advice; 246 were discharged to the care of friends; 75 died. Most of the deaths were associated with severe injury, generally of the head.

During the fifteen-year period 1923-1938, 327 men and 17 women were admitted to the relief station suffering from *delirium tremens*. By far the greater number of these patients were between the ages of thirty and forty-nine years. The most important statement in the article on this subject is that in spite of the seriousness of *delirium tremens*, 262 men and 13 women diagnosed as suffering from this condition remained in the relief station for one day only. Of this number 151 were transferred to other hospitals, but 27 left against advice and "a large number" went out in care of friends for treatment at home or elsewhere. Only two remained for more than a week. Most of the patients with *delirium tremens* were suffering from medical and surgical complications. The surgical complications were the more serious.

These figures make rather a melancholy recital. The most depressing fact that emerges from this report is the inadequacy of the treatment received by the alcoholic patient on account of his alcoholism. In an editorial article in the same journal it is pointed out that no attempt was made to study the patient as an individual, and psychiatric treatment, which is the basis for any hope of reclamation, was not available. The shortness of the stay in hospital is rather surprising; and though many of the patients with *delirium tremens* doubtless had treatment elsewhere, many, it may be safely stated, had no adequate treatment—no effort being made to discover "the causes behind the acute situation". Moore and Gray rightly insist that preventive medicine must take a prominent part in any attempt to deal with alcoholism. Since, as they also point out, the basic problems of the alcoholic patient are psychological and social, it is clear that symptomatic

[1] *The New England Journal of Medicine*, July 13, 1939.

treatment alone is not sufficient. Boston is not the only city in which the treatment of alcoholism is grossly inadequate. What should be everybody's business is almost nobody's. Here is practically a virgin field awaiting the energies of the health authority, the medical practitioner and the social worker.

MINIATURE X RAY PHOTOGRAPHS OF THE CHEST.

During the past few years miniature photography has become very widely used for the preservation in the least possible space of plans and documents. We have read lately of banks and business houses in England quickly and inexpensively duplicating their archives by this means as a safeguard against destruction from the air. In 1938 M. de Abreu, in Brazil, described a method for making miniature X ray photographs of the chest by means of photographing on cinematograph film the image produced with X rays on a fluorescent screen. This idea at once fired the imagination of radiologists in other countries; here was a process which would produce at something like one-thirtieth of the cost of X ray films radiographic records occupying a very small fraction of the space, and which would permit of the rapid radiological examination of large numbers of persons without the fatigue to the radiologist inseparable from long sessions before the fluoroscopic screen and sometimes responsible for failure to detect significant abnormalities. These obvious advantages have led to extensive trial of the method in Europe and Scandinavia for the examination of large groups for the detection of pulmonary tuberculosis. According to H. Fournié and M. Frezouls,[1] who have recently reviewed the subject, the time is ripe for the method to be considered an integral part of current radiological technique.

However, there is reason to think that some of those who have adopted the method in tuberculosis case-finding surveys may have allowed enthusiasm to outstrip caution; the advantages are illusory if a false sense of diagnostic security is engendered. It was found many years ago that with the radiological technique of the day a small lesion of the lung might be plainly discerned if situated in a plane close to the screen, but might be quite invisible if situated in a plane further from the screen. It was in order to overcome this difficulty and to avoid the enlargement and diffusion of the images of lesions in the chest due to divergence of the X rays that teleradiography was introduced, the radiography of the chest today being carried out with the X ray tube some two metres from the film instead of about a quarter of that distance as formerly; but fluoroscopy is still carried out with the tube at the shorter range. Another difficulty which has always existed in the radiography of the chest has been the loss of definition of finer pulmonary trabeculæ on account of the movements transmitted to them by the heart and great vessels. This has been overcome in recent years by reduction of the time of exposure to something of the order of one-twentieth of a second or less. The reduction in exposure has necessitated the use of very strong tube current and correspondingly powerful and costly plants, as has the increase in the distance between tube and film, since the intensity of the radiation reaching the film is inversely proportional to the square of the distance. Today it is generally agreed that the unfailing recognition and correct assessment of early or minimal tuberculous processes in the lungs, so all-important to the individual concerned, are matters requiring considerable experience and judgement and the close unhurried study in the best of light of actual films made by the most modern radiographic methods; and even now perfection is not attained. If miniature photographs are taken of shadows cast on a fluoroscopic screen by divergent X rays with an exposure greater than one-twentieth of a second, not only do the coarse grain of a screen used for viewing purposes and the grain of the film connote loss of the finest detail, but the technical developments of the past twenty years which have led to our confidence in the modern radiography of the chest are sacrificed.

Recently in South Africa B. A. Dormer and K. G. Collender[1] have overcome the photographic difficulties which made modern radiographic technique and the new miniature photography incompatible. A miniature camera has been made for them by the German firm of Carl Zeiss, possessing a lens of extremely wide aperture, f 0·85, with a focal length of 8·5 centimetres, said to be the largest of its kind in the world. The English firm of Ilford, Limited, has prepared for Dormer and Collender a special fluorescent screen of fine grain. Film has been prepared which is almost grainless and which has a Hurter and Driffield number of 9,800; and an exceptionally fine-grain developer is used. With this camera and this screen and film Dormer and Collender have succeeded in making excellent miniature photographs with an exposure of not more than one-twentieth of a second. To compensate for the short exposure and to allow of reasonably low penetration the tube current has been of the order of 300 milliamperes. Thus, according to the authors, with a focus-screen distance of 1·5 metres a penetration of about 60 kilovolts peak may be used. Since the method is essentially one for use on a large scale, many photographs being made in quick succession, a large rotating anode tube is essential. It may well be imagined that the cost of installation of the photographic and radiographic apparatus must be very great, so great as to make any general use of the method unlikely for some time to come, even if it were possible to reproduce in the present state of Europe the special Zeiss lens, quite the most costly piece of equipment. But the advances made by Dormer and Collender have been so great that methods employing the ordinary types of screen and film and cheaper lenses of smaller aperture will no longer be acceptable; the economy which they effect must be at the expense of the detail necessary for reliable skiagrams.

[1] *Revue de la Tuberculose*, July, 1939.

[1] *The Lancet*, June 10, 1939.

There can hardly be any doubt that miniature X ray photography of the chest is no ephemeral invention. It may be strongly opposed; but it has come to stay and may yet revolutionize the epidemiology of tuberculosis.

CIRCULATORY EFFECTS OF THE INHALATION OF "BENZEDRINE".

Beta-phenyl-iso-propylamine is a volatile compound which is well known by its trade name of "Benzedrine" and which is widely used as an inhalant for the relief of nasal congestion. The effects of benzedrine sulphate upon the circulation have been studied, and it has been noted that an increase in the pulse rate and both systolic and diastolic blood pressures has occurred. There is, of course, no essential difference between the possible effects of this drug when administered by the oral route and when inhaled except in degree; but it is of interest to know whether enough can be inhaled to produce a definite circulatory effect. "Benzedrine" sulphate has also well-known effects on the nervous system and also may adversely react upon the hæmopoietic function of the bone marrow; but such actions may be disregarded at the moment. C. M. Peters and J. M. Faulkner have carried out some investigations on the circulatory effects of volatile "Benzedrine", having in mind the close chemical and pharmacological relations of this drug to the adrenaline and ephedrine group.[1]

It is well known that adrenaline may cause unpleasant symptoms in persons suffering from *angina pectoris*, so that it is important to know if there is any objection to such patients using a "Benzedrine" inhaler. Peters and Faulkner refer to the work of Myerson and others on the circulatory effects observed after the subcutaneous administration of "Benzedrine" sulphate, and the interesting experiments of Waud, who investigated the effects of inhalation. In the latter case the dose taken was, as these authors point out, fantastically large, about 1,000 times the prescribed dose, for the experimenter inhaled entirely through tubes containing "Benzedrine" in a suitable volatile base for periods of four to six hours. It is not surprising that a rise in pulse rate and blood pressure followed such colossal dosage nor even that extrasystoles and paroxysmal tachycardia were also observed. Peters and Faulkner contented themselves with making observations on 67 subjects before and after they had taken five deep inhalations from a fresh "Benzedrine" inhaler in each nostril in the course of two minutes. Pulse rates and blood pressures were noted and electrocardiograms recorded. Patients with rheumatic, syphilitic, hypertensive and arteriosclerotic heart disease provided the clinical material for this inquiry, and ten normal controls were observed in the series. In the controls no significant change was observed at all. Slight but hardly significant changes were seen in the electrocardiogram in two cases of rheumatic carditis, but not in any other instance of cardiac disease, with one exception. This exception was one patient who had suffered from attacks of *angina pectoris*, in whom definite attacks followed immediately after the inhalation on two separate occasions. The possibility that a nervous factor had initiated these attacks was disposed of by the observation that inhalation from similar blank tubes containing no "Benzedrine" provoked no unusual symptoms. This patient was the only one out of a total of 28 subjects of angina who was in any way affected by the inhalant. The authors therefore conclude that heart disease *per se* is not a contraindication for the use of a "Benzedrine" inhaler in therapeutic doses, and that no pressor effect is likely to be observed in hypertension. It is suggested that caution is advisable in regard to its use by patients suffering from *angina pectoris*, though even here it would seem unlikely that ordinary use of the inhaler would adversely affect the majority of such persons.

[1] *The American Journal of the Medical Sciences*, July, 1939.

THE FUNCTION OF THE HYPOPHYSIS.

As is well known, typical changes appear in the anterior pituitary as a result of castration. Hohlweg, Junkmann and later Martins announced that these cellular responses do not arise in a pituitary graft when this is housed in a castrated animal, and Hohlweg assumed that there is a nervous sex centre which controls the liberation of gonadotropic hormones from the hypophysis. In Jores's aphorism the anterior pituitary is the switch which shunts nerve excitation into hormonal. Martins, however, was critical of this assumption and held that the artificial conditions of a graft prevent the normal response which would take place in the hypophysis *in situ*. In the meantime Westmann and Jakobson have demonstrated with fair certainty that the stimuli arising from the gonads reach the pituitary by nervous paths. One may instance as somewhat cognate the well-known outpouring of posterior pituitary secretion in the mother when the baby is put to the breast. In a recent issue of the proceedings of the Russian Academy of Sciences, K. Z. Kan has described his experiments,[1] in which, by using the elegant method of grafting into the anterior chamber of the eye, he has fully confirmed the findings of Hohlweg, namely, that the pituitary graft shows no castration effects. Further, the typical appearance of the anterior pituitary after thyreoidectomy was not observed in the eye graft. On the other hand, eosinophile cells appear in the pituitary transplant if the thyreoid or a portion of it is present in the host, and this reaction would seem to be hormonal. The general conclusion is that the hypophysis functions only when its nervous connexions are intact. If this view is correct, the domination and integrative control by the brain includes hormonal regulation, except perhaps those very local and peripheral actions, such as the formation of secretin.

[1] *Comptes rendus (Doklady) de l'Académie des sciences de l'Urss: Nouvelle Série*, Volume XXIII, Number 5, 1939.

Abstracts from Current Medical Literature.

PATHOLOGY.

Pulmonary Epithelium and Proliferative Reactions in the Lungs.

There are three prevalent conceptions concerning the pulmonary alveolar lining. The first is that there exists a complete endodermal epithelium continuous with that which lines the other respiratory passages. The second contends that the alveolar wall is incompletely covered by surviving endodermal cells. The third holds that the wall is completely divested of its original epithelium and is composed only of cells of mesodermal origin. In order to contribute towards a decision of this question Ira S. Ross (*Archives of Pathology*, March, 1939) has made experiments in which vital and supravital staining techniques have been used in the study of cellular reactions consequent to the introduction of both non-toxic and toxic substances into the lungs of rabbits. It could be shown that two distinct types of cells were stimulated. One of them was a non-phagocytic cell lining the alveoli, similar to and continuous with the epithelial cells of the bronchioles. The other type of cell was the macrophage. The first type arose from the epithelial cells which line the alveoli. It was stimulated slightly by non-toxic substances, but was increased to an appreciable extent only when toxic material was injected. The other type of cell, the macrophage, was stimulated by both the non-toxic and the toxic substances. It has been shown to arise from the connective tissue macrophage and to migrate freely across the alveolar epithelial borders.

Excessive Smoking and Carcinoma of the Lungs.

Franz Hermann Müller (*Zeitschrift für Krebsforschung*, June, 1939) draws attention to the steady increase in recent years of primary carcinoma of the lungs. Carcinoma of the lungs is now, apart from cancer of the stomach (58·56%), the most frequent form of cancer found in autopsies in men over twenty years of age (23·09%). Carcinoma of the lungs occurs five times more frequently in men than in women. He points out that in 1935 five times as many cigarettes were consumed as in 1907. He estimates that about 4% of the total income of the population is spent on tobacco. He also draws attention to the fact that the quality of the average tobacco has become gradually worse with its rising cost. The ribs of the tobacco leaves are mixed more and more into cigarette and pipe tobacco. These ribs contain large quantities of tarry products which have been proved in experiments by Roffo to be carcinogenic agents, and the author has therefore made thorough inquiries regarding the tobacco consumption of 86 male patients suffering from carcinoma of the lungs. Of these, 30% were extreme smokers (more than 35 cigarettes per day), 20% were very heavy smokers (26 to 35 cigarettes per day), 15% were heavy smokers (16 to 25 cigarettes per day), 31% moderate smokers (1 to 15 cigarettes per day), and 4% non-smokers. A comparison with the same number of healthy men of about the same age showed 4·5% extreme smokers, 6% very heavy smokers, 25·5% heavy smokers, 48% moderate smokers and 16% non-smokers. The average daily consumption of the 86 patients with lung cancer amounted to 2,900 grammes of tobacco, in comparison with the consumption of 1,250 grammes by the same number of healthy persons. The author therefore comes to the conclusion that one of the main reasons for the increase of the occurrence of lung cancer is excessive smoking. He does not overlook the fact that about one-third of the patients are moderate or non-smokers, and suggests that other causes, such as dust in certain factories and dust from tarred roads, are responsible for a certain amount of lung carcinoma.

Carcinogenic Agents Present in the Atmosphere and Incidence of Primary Lung Tumours in Mice.

J. Argyll Campbell (*The British Journal of Experimental Pathology*, April, 1939), using the mouse-skin test, has tested for carcinogenic potency tarry matters from the following: dusts from tarred roads, cigarette smoke, chimney soot, soot from exhausts of internal combustion engines burning heavy oil, a binding material in cardboard. As proved by the production of skin cancer, the tarry matter from tarred roads contains potent carcinogenic agents, as does chimney soot; but under ordinary conditions the effect of the latter in its action on the skin seems to be mitigated somewhat by the presence of the carbon of the soot, while the effect of the former seems to be aided by the presence of inorganic constituents. Cigarette smoke, in ordinary circumstances, gives rise to tarry matter which may occasionally produce hyperplasia and cancer of the skin after prolonged application. Tarry matters from the motor exhaust soot and from the cardboard tested do not produce cancer when painted on the skin of mice. Exhaust soot suspended in the atmosphere slightly increases the incidence of lung tumours in mice, while chimney soot does not produce any noticeable increase. The dust from tarred roads appears to be the most dangerous source of carcinogenic agents; when inhaled, it gives the highest incidence of lung tumours in mice. It is considered that here again the inorganic constituents in this dust (for example, silica, iron) enhance or aid the effect of the tar, while, on the other hand, the carbon of soot tends to mitigate any effects of the tar present in producing tumours of the lungs. Irritation without inflammation appears to play a part in genesis of these tumours both in control mice and those subjected to experiment. Although some primary lung tumours in mice are simple adenomata, other tumours reveal characters of typical malignant disease with production sometimes of metastases. Further, examples of metastases have been obtained.

Effect of "Thorotrast" (Colloidal Thorium Dioxide) on Ependymal Lining and Related Parts of the Brain.

"Thorotrast", a colloidal preparation of thorium dioxide, is recommended by some as a contrast medium for ventriculographic work preferable to air, as D. Beres (*Archives of Pathology*, July, 1939) states. A review of the literature shows that the question as to whether the use of "Thorotrast" in human beings is entirely without hazards is not fully answered. A very slow elimination and changes in the ependymal lining of the ventricles have been reported. The author therefore describes a case in which a patient lived for twenty-seven days after the introduction of "Thorotrast" into the ventricular system. A large amount of this substance was still present in the ventricular cavities and in the subarachnoidal spaces, though there was no obstruction to the flow of cerebro-spinal fluid, as demonstrated by the fact that a considerable accumulation of "Thorotrast"-laden macrophages was observed in the subarachnoid spaces. The "Thorotrast" caused extensive damage in the ependymal lining, especially in the right lateral ventricle, into which the substance had been directly introduced. The pathological changes consisted of desquamation of ependymal lining and extensive macrophagic accumulations in the ventricular cavities, about the choroid plexus and in the subarachnoid spaces. "Thorotrast"-laden macrophages were also found in the perivascular spaces of the subependymal zone. In several areas ependymal cells filled with particles of "Thorotrast" could be seen becoming detached and rounding up. The author draws the conclusion that "Thorotrast" is not readily excreted by the central nervous system and may remain in the ventricular cavity for long periods in spite of the absence of obstruction to the flow of the cerebro-spinal fluid. "Thorotrast" produces extensive inflammatory and destructive changes in the ependymal lining. The clinical use of "Thorotrast" for the visualization of ventricular cavities is unsafe.

The Lymphoid Nodules of Human Bone Marrow.

R. J. Williams (*The American Journal of Pathology*, May, 1939) reports on the examination of the bone marrow in 265 unselected cases. All were adult individuals. Those

showing primary diseases of the hæmatopoietic system were excluded. He found that lymphoid nodules occur frequently in the bone marrow and that they are definitely associated with active red marrow. They occur in a wide variety of diseases, are frequently found in cases in which no infection or significant inflammatory lesion is demonstrable, and are also present frequently in the marrow in cases of sudden death from traumatic injuries. Local lesions in the bone marrow do not account for these foci. The lymphoid nodules are found more frequently in the marrow in persons over forty years of age than in that of adult but younger individuals. No pathological significance can be attached to the presence in the marrow of lymphoid nodules of the type, size and number described in the report. The evidence appears to justify the concept that the lymphoid nodules are essentially normal though perhaps variable constituents of the active red marrow of adult persons.

MORPHOLOGY.

Motor Apparatus in Echidna.

F. Goldby (*Journal of Anatomy*, July, 1939) confirms the findings of Abbie as to the extent and position of the excitable cortex in *Echidna*, and as to the degree of representation of the body. Experiment showed that removal of the motor cortex for the hinder part of the body produced degeneration in the *Zonalbündel* of Koelliker, thus confirming the opinion of Fuse as to the pyramidal nature of this tract. These experiments did not explain the observations by Abbie and by Addens and Kurotsu that there is a small pyramidal tract in the normal mammalian position in *Echidna*.

The Thymus Gland.

S. Baginski and J. Borsuk (*Bulletin d'histologie*, April, 1939) discuss the evidence for and against the view that the thymus gland is part of the reticulo-endothelial system, and, on the basis of their own experiments, decide against the theory. They find that when trypan blue or lithium carmine is injected, the particles are taken up exclusively by the histiocytes of the interlobular connective tissue. Coloured particles appear in the Hassal's corpuscles only when these are degenerate, and they could never be found in the reticulum of the thymus. In discussing the characters distinctive of cells of the reticulo-endothelial system the authors point out that the particles which a cell may absorb may be of two kinds, microscopic or ultra-microscopic. While all cells possess to a greater or lesser degree the power of absorbing particulate matter from the surrounding medium, only cells of the reticulo-endothelial system are capable of absorbing ultramicroscopic particles. This process is known as *colloïdopexie* or atrocytosis. Ordinary cells absorb microscopic particles by the production of pseudopodia (phagocytosis), while reticulo-endothelial cells take up ultramicroscopic particles by an alteration in surface tension (ultra-phagocytosis). Retention of particles in the cell depends upon their value there. Glandular cells also possess some power of absorbing ultramicroscopic particles, but in this case the particles are accumulated in small quantities in the zone of Golgi.

Red and White Muscle.

M. Watzka (*Zeitschrift für mikroskopisch-anatomische Forschung*, Number 4, 1939) has studied the structure and incidence of red and white muscle in domesticated and in wild animals. The white muscles of the domesticated rabbit and dog appear to be less efficient in comparison with the dark muscle of the domestic rabbit and the muscles of the wild rabbit or the flying muscles of the partridge. They are poorer in myofibrillæ and glycogen, have fewer nuclei and a higher water content. The number of nuclei is in exact proportion to the number of myofibrillæ, and so to the working capacity of the muscle fibre. There is less distinction in colour and structure between light and dark muscles of the leg in the wild rabbit than in the domestic rabbit. The muscle fibres of the wild rabbit are markedly richer in fibrillæ and nuclei than are the corresponding fibres of the domestic rabbit. Red muscles are much better supplied with blood vessels and capillaries than are white, while the connective tissue between the fibres, the perimysium and its contained elastic fibres are much better developed. The author states that the greater water content, together with the decrease in fibrillæ and nuclei, contributes to the greater benefit derived from so-called "white flesh".

The Corpus Callosum.

A. A. Abbie (*Journal of Comparative Neurology*, February, 1939) has reinvestigated the problem of the origin of the *corpus callosum* in an extensive series of animals, including Monotremata, Marsupialia, Insectivora, Cheiroptera, Rodentia, Carnivora and primates. He concludes that the callosal fibres pass dorsal to the hippocampus, not ventral through the hippocampal commissure, as in the Elliot Smith theory. The supra-callosal structure is thus an everted lip of subiculum, not a hippocampal remnant. He states that the *fornix superior* is carried over with the *corpus callosum* from the dorsal part of the alveus and, becoming apposed to the *fornix inferior*, obliterates the intervening hippocampus. Extension of the *corpus callosum* stretches the *fornix superior* longitudinally to produce the *fornix longus*. The *cavum septi pellucidi* is not produced by secondary closure of the space between the paraterminal bodies, but, as Hochstetter found in the human fœtus, appears when tension on the *lamina terminalis* by the expanding *corpus callosum* causes a condensation into the two laminæ of the *septum pellucidum*. The author concludes that his views throw light upon the origin of placental mammals.

Anterior Superior Dental Nerve and Vessels.

F. Wood Jones (*Journal of Anatomy*, July, 1939) points out that current descriptions of the blood and nerve supply of the upper teeth in the human are inaccurate. The posterior superior dental nerves leave the infra-orbital nerve before this enters the infraorbital canal. There are usually three, of which one passes to the buccinator muscle, while the other two supply the maxillary teeth as far forwards as the canine. The author doubts the existence of a middle superior dental nerve. The anterior superior dental nerve forms a single large trunk which usually leaves the parent infraorbital nerve shortly after this enters its canal. It runs forwards in a separate canal lateral to the infra-orbital until it reaches the anterior wall of the maxilla. Here the nerve in its canal turns medially in a wide curve beneath the infraorbital foramen to reach the lateral narial margin. At this point the canal and nerve turn downwards, skirting the narial margin, and finally pass medially across the floor of the nose, where the nerve emerges through the *foramen septale*. The nerve is accompanied by its corresponding vessels and gives twigs to the incisor teeth as it swings medially. The canal is large and is called the *canalis sinuosus* by the author, who points out that this and the large nerve it contains bear no resemblance to modern descriptions of small separate nerve twigs, each in its own canaliculus.

The Isolated Visual Cortex.

W. E. Le Gros Clark and S. Sunderland (*Journal of Anatomy*, July, 1939) have studied the changes produced in the structure of the visual cortex when it is isolated from surrounding areas. The experiments were conducted upon monkeys. They find that there is relatively little change in cell or fibre structure after such a procedure. There is a slight general reduction of cells in all laminæ, while most of the large cells in lamina IV^b, and some of those in lamina VI atrophy and disappear. There is also a reduction in the radial fibres and almost complete disappearance of the deeper oblique fibres. The stria of Gennari remained apparently unaltered. The authors suggest that the large cells which atrophy give rise to projection fibres to subcortical centres, while the reduced radial fibres are probably association fibres derived from other parts of the visual cortex. The deeper oblique fibres appear to be projection fibres from subcortical centres.

Special Articles on Civilian War Casualties.

III.

EMERGENCY ORGANIZATION OF THE MEDICAL PROFESSION.[1]

The medical profession is intimately concerned with war preparations, and unless pre-war organization is arranged for, confusion is likely to arise. Under a voluntary system the keenly patriotic people will offer for service at once and sacrifice their personal interests for those of the nation. An unsystematic method of enlistment leads to the creation of many anomalies and hardships, which are avoidable by adequate planning and coordination. Controlled allocation and distribution of medical personnel are called for and must have regard to both military and civil needs.

The Federal Committee of the British Medical Association was faced with this problem during the last war and conducted a referendum on intraprofessional conscription of the profession. The required majority of 75% in favour of such action fell short by 2%. From time to time since the close of the war the problem of the most effective and equitable use of the profession in war-time has been under discussion by the Federal Council and by several Government committees, on some of which the Association was represented. No finality, however, was reached by any of these bodies, and in 1937 the Federal Council approached the Commonwealth Government in order that some plan might be devised.

Early in 1938 the Council of Defence set up a body called the Committee on Coordination of the Medical Services in respect of civil, naval, military and air force requirements in time of war.

The committee consists of the Director-General of Medical Services (Army and Royal Australian Air Force), the Director of Naval Medical Services, the Commonwealth Director-General of Health, the Director of Army Mobilization, and two medical men nominated by the Federal Council of the British Medical Association.

The pertinent terms of reference of this committee are the following:

> 1. To examine and report on the coordination of medical arrangements in time of war, having regard to the reports of the Subcommittee of the Committee of Imperial Defence.
>
> 2. In conjunction with term 1: (*a*) to consider the recommendations of previous committees and to submit any recommendations deemed necessary for variation; (*b*) to consider and make recommendations as to the provision of medical personnel, medical equipment, and hospital accommodation in time of war, having regard to the needs of both the armed forces and the civil community, and to the coordination of requirements.

The committee met first in July, 1938, and has sat on four occasions since that time. It has submitted two reports and various recommendations, all of which received ministerial approval. Its decisions may be said, therefore, to have laid down the principles under which the medical personnel of the Commonwealth will be utilized in time of war. These principles include a measure of control which will be exercised, under authority, by an executive committee on which the Association will be represented by a nominee of the Federal Council.

The Central Executive Medical Committee, on the outbreak of war, will consist of a chairman, appointed by the Commonwealth Government, a medical officer of the Defence Department, the Director-General of Health, and a representative of the British Medical Association. It will be charged, amongst other duties, with executive control of the provision and distribution as between the armed services and civil community of medical personnel, hospital accommodation and medical equipment. It will be, in effect, and acting through the British Medical Association, the producer of medical officers for all purposes. Allocation to specific duties, for military needs, will, of course, be the province of the Defence Department.

In the meantime the committee appointed in 1938 remains as a standing committee of the Council of Defence. It is obvious that, under the political and geographical conditions in Australia, State committees are an essential requirement to enable controlling machinery to function adequately; and such committees have been formed, under the authority of the State Premiers, to work under the general direction of the Committee on Coordination of the Medical Services (in peace) or the Central Executive Medical Committee (in war).

Having regard to both civil and military requirements and to the functions as set out in the terms of reference, the composition of the State committees was decided thus: as chairman, a medical officer of the Defence Department (in peace time he is the Deputy Director of Military Medical Services) and, as members, two representatives of the State branch of the British Medical Association, a representative of the State Health Department, and a representative of the hospital authority of the State, if the hospital administration is not under the control of the health department. There is power to coopt other persons for special purposes.

Each State committee is charged with the task of preparing a scheme of action to be carried out in time of war, and on the outbreak of war it is to be merged into a standing executive committee of the central medical executive committee.

The committees in the various States have already done a considerable amount of work towards the making of the necessary plan of action.

It was appreciated by the Committee on Coordination that the most important matter to be decided was the means by which the supply and distribution of medical practitioners in time of war should be controlled, and the method described above was devised as, in the opinion of the committee, likely to prove the most useful.

Medical personnel, of course, includes, besides medical practitioners, dentists, pharmacists, trained nurses, voluntary aids, masseurs, instrument makers, X ray technicians, dressers, and the rank and file for various medical units, both civil and for the armed forces.

We are concerned here only with medical practitioners who are available for the requisite services. Through the State Branches of the British Medical Association a calculation was made according to the capacity and special training of individual members. This, however, was obviously an inaccurate method of ascertainment, leading to incomplete information. Plans were to be framed on the maximum effort being required of the defence forces, and medical officers were to be distributed according to their age and training, and with reference to the needs of the civil community.

The Coordinating Committee, in association with the State committees, set for itself the following tasks: to review the Army Medical Corps, the Royal Australian Air Force and Royal Australian Naval Reserve lists, in order to bring them up to necessary strengths; to approach every medical practitioner in Australia to ascertain what form of service he or she would be prepared to give, and to classify medical practitioners in accordance with the information received; and to prepare and maintain an index of medical practitioners grouped in accordance with their capabilities.

A *questionnaire* was therefore forwarded to every medical practitioner in the Commonwealth whose address could be found. This entailed a very considerable amount of work and an appreciable cost in money. In Great Britain a similar *questionnaire* was sent out by the British Medical Association, at the request of the Committee of Imperial Defence, but at its own expense, although the Association was later reimbursed by the Government. During last year the Federal Council was rather preoccupied over the

[1] A lecture delivered under the auspices of the Melbourne Permanent Post-Graduate Committee on July 20, 1939.

national health insurance proposals, and it certainly could not itself have afforded the expense involved. The work was therefore undertaken by the Defence Department, and the medical profession is under some obligation for this action and should feel most grateful for it.

The form of the *questionnaire* was the result of very much thought and consideration by the Coordinating Committee, and as you have each received it and most of you have replied to it, no further reference need be made to it.

As the members of the British Medical Association in Australia during 1938 had been rather overwhelmed with *questionnaires* and circulars, some delay was thought advisable in inflicting upon them still another, even though it was certainly more concise, easier to reply to and for a different purpose. Its dispatch was therefore delayed until November, and the committee, with some experience of the usual response to the request for information from members of the medical professsion, was somewhat pessimistic about the outcome.

Such was the diligence of the officers of the Defence Department that by the end of February, 1939, 6,000 copies of the *questionnaire* had been sent out, although that was not the complete list. By March 3, 4,100 medical practitioners, or 70%, had replied, 1,750 still not having done so; of those numbers, 3·3% were abroad, 100 were dead and 10·5% had retired from practice. Of the 70% who had replied, 83% were both willing and able to give their services. It may be remarked here that this result in Australia was far better than that obtained in Great Britain two years after the questions had been sent out, although at the time of the crisis of September, 1938, 96% had replied.

The work of classifying and indexing the information thus obtained has been going on and is nearing or at completion. All those who replied have received an acknowledgement. Owing to the inevitable changes which take place from various causes, as to the numbers and the state of mind of medical practitioners, arrangements have been made for an annual revision of the available doctors and their willingness to serve.

The *questionnaire* was sent out because it was deemed necessary to consider an analysis of the composition of the medical profession, for example, as to the numbers of general practitioners, surgical specialists, anæsthetists, ophthalmologists *et cetera*, and as to the proportion of specialists to general practitioners. From the information thus obtained further consideration could then be given to the allocation and distribution of medical practitioners. It is expected that, by means of this index, it will be easy for the military administrators to select suitable men for particular positions and to avoid mistakes, such as the sending into forward areas of hostilities of men who are specially equipped for research work or as medical officers of specialized hospitals. The index will also serve the civil authorities in staffing towns and areas deprived of medical aid by the calling up of men fitted for the field units of the armed forces.

It is assumed that at least at the advent of a state of emergency the voluntary system will function, although in relation to a major emergency there may be need for special legislation in order to institute adequate control of the distribution of the medical professison.

The ideal arrangement is one that would be practicable, adequate and under proper authoritative control, and for the distribution of the purely medical personnel it may be visualized as follows:

1. *Armed forces, navy, army and air*:
   (*a*) Field units.
   (*b*) Hospitals and similar institutions.
2. *Civilian doctors*:
   (*a*) Those engaged in their own work in private practice.
   (*b*) Those allocated to areas denuded of medical practitioners by naval and military authorities.
3. *Hospital personnel*:
   (*a*) Resident staff.
   (*b*) Visiting staffs.

The creation of a medical personnel for all these purposes would be brought about and controlled by an executive committee possessing full authority to act. On this executive the medical profession is fully represented by both whole-time officers and private practitioners.

Brief reference only is necessary to the provision to be made for ordinary and necessary equipment for daily use and stocks to be held in reserve. It is sufficient to say that these matters have been gone into in very great detail and are adequately provided for.

The same observation may be made with regard to the establishment and distribution of all other phases of medical personnel.

The provision of extra hospital accommodation to meet a sudden demand for a large number of extra beds is an essential part of any emergency plans. Australia has had some experience of that necessity during the existence of epidemic conditions, such as the influenza epidemic in 1919 and the recent wave of infantile paralysis in Victoria. Some years ago a plan was produced in Melbourne for emergency beds by the Central Hospital Advisory Council.

In a war emergency institutions of various kinds are adaptable for purposes other than the housing of sick and wounded people, and coordination of the varying requirements of the occasion is necessary in planning for the accommodation of large aggregations of individuals, both well and ill.

Detailed plans have been drawn up for the use of existing hospitals, the adaptation of other buildings, and the erection where necessary of temporary general and special hospitals. Already offers have been made of private homes to be used as temporary hospitals. In some States detailed plans have been made for the medical and nursing staffing of hospitals of all kinds, as well as for the equipment.

Voluntary Organizations.

As auxiliaries to the medical services of the armed forces voluntary organizations have a definite place in the medical arrangements for the care of sick and wounded sailors and soldiers. Bodies which have a standing relationship to this work are the Red Cross Society and the Order of Saint John of Jerusalem. While their main function is the provision of comforts, they are likely to be used to supplement the work of the Army Medical Corps in actual treatment. It is possible that such help may take the form of the establishment and maintenance of auxiliary hospitals and convalescent homes.

In the latter event the assistance of medical practitioners not engaged in service with the armed forces will be necessary. Some trained nursing help will also be required; but the nature of the work to be done enables these societies to utilize the services of lay people who have had some training of an elementary nature.

It is necessary, therefore, to train these "voluntary aids" prior to the occurrence of emergency conditions. In this training the medical profession plays an essential part, and the work that has been done and is being done in this regard is very gratefully acknowledged by the Red Cross Society and the Order of Saint John.

During the last war the Joint War Committee of the British Red Cross Society and the Order of Saint John of Jerusalem in England employed about 400 medical men at home and abroad. At first there was no difficulty in obtaining all the medical help required. In November, 1915, the War Office claimed the services of all medical practitioners under forty-five years of age who were physically sound. This immediately reduced the number and quality of the candidates for Red Cross purposes. Two years later the military age for the medical profession was raised to fifty-six years; thus there were left for the Red Cross those only who were advanced in life, physically unfit for active service, or resident in places where the *Military Service Act* was not in force.

The medical personnel required for Red Cross establishments in Australia would necessarily be recruited from practitioners unsuited for utilization by the navy and army. Medical women and men over the age of forty-five years would thus be invited to offer their services, or

under conditions of conscription would be allocated to these duties.

With highly efficient naval and army medical services, and with well-functioning State hospital administrations, it is probable that in Australia the voluntary organizations will have very little need for the services of a medical personnel for military purposes. In any event, no action would be taken for the organization of auxiliary medical aid unless and until it had been requested by an overtaxed military medical service or by State authorities.

Provisional war plans are being made by the Red Cross Society to prepare for any such request, should it eventuate. These plans will include the setting up of a medical personnel department, such as that in existence in London during the war, under the direction of the late Sir Frederick Treves.

Civilian Casualties in War.

Striking evidence is available of the precarious situation in which the civil population of a country at war is placed, in consequence of modern methods and engines of war. All countries likely to be involved in war have made some plans to deal with this problem. The scheme of the Victorian State Emergency Council has been published and it has been further explained today.

Apart from the organization of hospital accommodation under this plan, medical service is required in the staffing of first aid posts and possibly also in that of mobile first aid parties and ambulance work. The arrangement of the personnel for these duties has been entrusted to the Red Cross Society and to the Order of Saint John in Victoria.

The plan provides that in each municipal area under the control of a warden there will be established first aid posts, distant about one and a half miles from each other. At each post the following personnel will be placed: one medical officer, one administrative officer, one trained nurse, sixteen fully trained first aid personnel (six men, ten women), twenty-two assistants (ten men, twelve women), one storekeeper and clerk.

In each area the medical arrangements will be under the direction of the area first aid commandant, who will be a medical man or woman.

The method of procedure would be that small first aid parties would proceed by car or light truck to the scene of an accident, render all necessary first aid, determine whether the patient should be sent to his home, a first aid post or hospital, and arrange accordingly.

At the first aid posts no major procedure or treatment would be carried out, although provision for blood transfusions might be considered essential.

The Red Cross Society is engaged at the present time in the task of selecting the personnel referred to. It has nominated to the State Emergency Council a medical man as first aid commandant in each area, keeping as far as possible to practitioners not likely to be called up for military service. This medical man will, in like manner, select a medical officer for each first aid post in his municipal area. The rest of the personnel in each detailment will be appointed by the Red Cross Society.

In like manner the Order of Saint John Emergency Service Committee is selecting persons suitable to be enrolled in mobile first aid parties. The cooperation of the medical profession is an essential requirement of all these plans.

The blood transfusion service of the Red Cross Society is establishing an emergency list of donors from amongst the large number of women who are undertaking training for service in this State. These will in time of war replace the male donors who will be called up for defence work.

The Red Cross emblem—a red cross on a white ground, formed by reversal of the design of the national flag of Switzerland—has some status in assuring immunity from hostile attack, provided it is used in accordance with the regulations of the Geneva and Hague Conventions. The right to its use is confined to the Army Medical Corps and to hospital ships of the navy and to the auxiliaries of these bodies.

Its use to protect places of security at which civilian casualties may be treated is not yet clearly defined. At the sixteenth International Red Cross Conference, held in London in June, 1938, the matter came up for discussion, following which representations have been made to the sixty-two countries who are signatories to the Geneva Convention, and national Red Cross Societies have been invited to approach their respective governments.

The object of these representations is the application of the principle of general protection to civilians, who are not members of the armed forces and who abstain from committing or partaking in any hostile activities, and also the extension of the protection of the Geneva Convention to the Red Cross personnel acting for the benefit of civilians.

The hope is expressed that this necessarily brief account of the plans for the coordination of medical activities in time of war will give some indication of the vast amount of thought that has been given to this difficult problem, and of the great deal of work that has been done. Most of the details are required to be withheld from publication; but it would appear that no great harm would result by providing rather more information than has hitherto been released.

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University Intelligence.

THE UNIVERSITY OF QUEENSLAND.

Official Opening of the Medical School.

The medical school of the University of Queensland, situated at Herston Road, Brisbane, was officially opened on August 11, 1939, by the Honourable W. Forgan Smith, LL.D., Premier of Queensland.

The Chancellor of the University, Sir James Blair, K.C.M.G., who took the chair, said that the ceremony marked an epoch in the history of education in Queensland and of the university.

After he had received a key from the Minister for Works, who asked him to open the building, Dr. Forgan Smith said that the new medical school was the culmination of years of patient and determined effort. He traced the history of the foundation of the medical school from June, 1914, when the senate of the university appointed a special committee to collect information and report on the prospect of founding a medical school, to its establishment in 1936, when 70 students were enrolled. In 1939, he stated, students numbered 204. Dr. Forgan Smith went on to talk about the place of a university in the life of the State. The University of Queensland was the coping stone in the educational system of Queensland. The people of the State were determined to equip their children for the battle of life in the best possible way and, more important still, to teach them how to live. The university could play its proper part in the life of a nation only if its students regarded the time spent within its walls as a period of training for greater and specialized service. Dr. Forgan Smith then officially declared the building open.

On behalf of the University of Sydney, Professor J. C. Windeyer conveyed greetings from the Faculty of Medicine and the University of Sydney, and congratulated the University of Queensland on its progress and on the important advance marked by the ceremony.

The Vice-Chancellor of the University of Queensland, Mr. John Douglas Story, I.S.O., proposed a vote of thanks to Dr. Forgan Smith and paid a tribute to his work as Premier during crowded years of progressive constructive development.

In supporting the vote of thanks, Dr. Neville Sutton, President of the Queensland Branch of the British Medical Association, said that the establishment of a medical

school in Queensland must evoke an immediate feeling of deep satisfaction and approval among members of the medical profession. After referring to the wisdom of the Government of Queensland in its devotion of a large sum of money to the establishment of the school, Dr. Sutton said that it was the duty of all concerned to make the most of the opportunity offered by the creation of the school and to further its progress. The medical profession was ready and eager to do its utmost to make the school fit to take its place alongside the famous older schools of the Empire and to demonstrate to the people of Queensland that the venture had been well conceived and could not fail to pay ample dividends to benefit the health of the community.

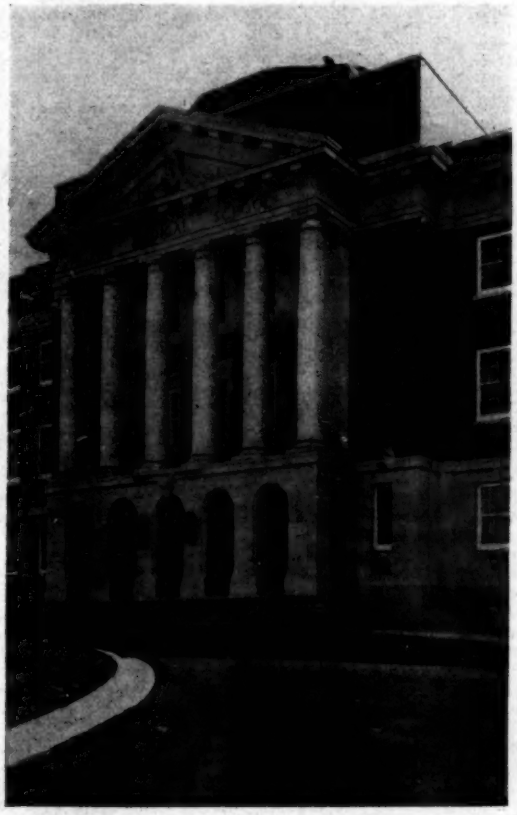
Description of the Building.

The following description of the building is taken from the official handbook provided for the opening ceremony.

The new medical school of the University of Queensland occupies a commanding position at Herston on a triangular-shaped site of over six acres, adjacent to the western boundary of the Children's Hospital and within a few minutes' walk of the General Hospital, where ample material will be readily accessible for the students to obtain the necessary practical experience.

Full advantage has been taken of the pleasing effects to be obtained from a sloping site by placing the building well up on the hillside. From Herston Road a comfortably graded double bitumen drive flanked by footpaths leads to the main entrance and encircles formal garden plots and the site for a memorial fountain, while from Weightman Street access is made to both the ground and first floors. The layout of the grounds has been made with the object of preserving an informal and natural setting and has been achieved by the planting of expansive sloping lawns and terraces over which the beautiful native trees cast inviting shadows.

In order to obtain ample light and ventilation on the ground floor, the site has been excavated on the Weightman Street alignment and a concrete retaining wall, surmounted by a concrete fence and wrought-iron gates, provided. Here the grounds are laid out formally with concrete paths, grassed terraces and sunken gardens, while provision has been made at one side for an asphalted car parking space enclosed by native trees.



New Medical School, Brisbane, Main Entrance Portico.

The building is a dignified example of Renaissance architecture, three stories in height, and surmounted by a copper dome rising from a flat roof, where high parapets mask the animal houses built there. The strictest economy has been observed in the design, the effect being obtained by the use of symmetrical rows of well-proportioned windows and the classical portico and entablature traditional to the type of architecture selected. Externally, specially selected red face bricks have been used, and the walls to the level of the first floor, the entrance portico, and the crowning entablature have been finished in plaster, coloured, and jointed to resemble stone.

The building has so been designed that, should the necessity arise at some future time, extensions in the form of projecting wings can be added at either end to the central portion, which measures 222 feet in length.

The approximate cost of the building and the layout of the grounds is £91,000 and an additional £6,500 has been expended on furniture and fittings.

It is intended that fourth, fifth and sixth year students will receive the whole of their training in all branches of surgical and medical science in the medical school and the third year students in anatomy, while first and second and the remainder of the third year work will be carried out at the present university and later on at the new building in the course of erection at St. Lucia.

The layout of the building is very straightforward—the main rooms being entered from the corridor which runs the entire length of the north-eastern side of the building, and subsidiary rooms from transverse passages. This corridor serves the dual purpose of providing access to the rooms and, in place of an external colonnade, protects the rooms from the heat of the sun and the strong glare. All windows in the building, with the exception of those on the south-eastern side, are glazed with special anti-actinic glass, of a soft bluish-green, which colour is soothing to the eyes and counteracts the glare. At the same time it reduces heat transmission through the glass and results in a corresponding reduction of temperature throughout the building. This is only one of the many innovations which the great advance of building science has rendered possible of incorporation in this building from the outset, while sound-proofing, acoustics, ventilating systems, refrigeration (including the supply of iced water to stainless steel drinking fountains in the corridors), stainless steel and chromium plated fittings, improved electrical and drainage systems are amongst the many amenities in the new medical school.

The maze of service pipes, so necessary in a building of this type, is entirely hidden from view by the construction of a double wall running the entire length of the building and concealing continuous horizontal and vertical ducts, the former two feet deep behind sliding panels located close to the ceiling, and the latter (six in number) fitted with access doors and carried down to a tunnel, eight feet wide and five feet six inches high, beneath the corridor on the ground floor. The source of any trouble is thus very easily localized and remedied.

The construction of the building is fireproof throughout, the partitions are of brick-on-edge, the floors to the portico, main entrance hall, lavatories and staircase are of terrazzo, corridors of concrete, and the remainder of the floors are of concrete covered with pine and laid with battleship linoleum, while the flat roof is of cell concrete.

The walls generally are plastered and painted or colour-washed, and the ceilings are of fibrous plaster, but the more important rooms have their walls panelled in maple or silky oak veneer.

The entrance portico, approached by a broad flight of concrete steps, gives access through ornately carved maple doors to the main hall, and immediately on the left to the office, the students' common rooms and lavatories being grouped round the main hall but entered from lateral passages. The main hall, the passages and the stair hall, which is entered through a wide archway from the rear of the main hall, are all panelled in diagonal cut maple veneer and have enriched fibrous plaster ceilings.

The western end of the building provides accommodation for the professor of anatomy, with private office, laboratory and dark room, and at the rear are an anatomy store-room and a carpenter's room.

The wing at the eastern end is devoted to a lecture room, from which opens the operative surgery and surgical anatomy room (finished with a dado of white tiles and an asphalt floor), with a demonstrator's room and mortuary opening off it again.

On the second floor the most important feature is the centrally situated lecture theatre, with accommodation for 178 students. The specially designed theatre seats, upholstered in leather, are arranged in a steep gallery of six tiers, in the shape of a fan, to give an uninterrupted view of the lecturer's bench and the screen behind. In order to accommodate the gallery the theatre has been carried up an additional story and provides the structural necessity for the dome above. The very careful consideration given to the design and equipment of this room has been justified by the gratifying results.

The walls are covered with "Sorb-soun" acoustic tiles and the ceiling lined with "Tentest" acoustic board, all coloured in a soft buff; the gallery fronts are panelled in maple veneer outlined with vertical aluminium cover strips, and the writing slopes are of polished maple, affording a fine display of this handsome timber and matched in the panelling of a sounding board above the lecturer's bench.

New Medical School, Brisbane.

In the slightly projecting central feature at the rear of the building the lift and staircase are axially placed, and adjoining are the visiting lecturers' room, with parquetry floor and diagonally cut maple veneer panelled walls, and the motor room, respectively.

On the first floor the whole central portion of the building is devoted to the library (approximately 50 feet by 40 feet), with its walls finished in cream plaster and furnished with dark polished silky oak book stacks, handsomely designed reading tables, chairs and easy chairs, and special lighting facilities.

The whole of the western wing is occupied by the main pathological laboratory and a lecture room adjoining. The laboratory accommodates fifty-six students at island benches and an additional number at wall benches, each student being equipped with a sink, gas, water, and electric points, and microscope cabinet.

All windows are fitted with glass wind deflectors, also blinds for darkening the room for film projection work *et cetera*, and in both rooms the hyloplates are illuminated by strip lights and are provided with screens for epidiascope and projector work.

At the eastern end is a large histology preparation room with store and microtome room adjoining, and opening off a central longitudinal passage from the histology room are lecturers' and photographic rooms—the latter with a dark room opening off, a serology room fitted with a refrigerator, and an incubator room. Adjacent to the stairway are the bacteriology and centrifuge rooms respectively.

At the back of the dais is a large hyloplate specially illuminated and fitted with special bead and aluminium screens to prevent distortion from the side seats during projection work, which is carried out from the central tunnel passage, over which is built the fire-proof box for film projector work, while provision is also made for an epidiascope to project microscopic slides and book illustrations.

The lighting to the theatre is by means of windows set high in the walls, and the blinds are electrically controlled from the lecturer's bench. A special ventilating system has been installed, with the main inlet ducts placed around the walls and the outlet duct behind the dais, the ventilating fans being installed under the gallery, and the fans to withdraw the vitiated air through special ducts are situated in the roof. In the corners of the theatre adjacent to the corridor are patients' and apparatus rooms respectively, while the tunnel passage gives access to a large store under the gallery, from which the professor's laboratory, the preparation and mounting room, and the museum may be entered, thus avoiding the necessity for transporting material through the main corridor.

Light for the store is obtained through the five windows covered with ornamental metal grilles, which form a feature of the entrance portico.

With the exception of the preparation room, the entire eastern wing is devoted to the museum, another department which calls for special attention; the walls are finished in white with a pale green dado, and the fittings throughout—island museum cases with movable glass

shelves and sliding glass doors, exhibit cases built into the niches in the walls, and the bench running the full length of the southern wall—are in beautifully grained silky oak. The excellent natural lighting provided on the two external walls is amplified on the other two sides of the room by "Barlok" prismatic roof lights, framed in the flat roof above and shedding a softly diffused light.

In the western wing the pathology professor's laboratory abuts on the lecture theatre; adjoining this laboratory is the laboratory of the professor of social and tropical medicine, with research laboratories close at hand, where much valuable work will be carried out. The committee room, panelled in specially selected quarter-cut maple veneer, and rooms for lecturers in surgery and medicine complete the wing, while students' lavatories adjoin the staircase.

The building is equipped throughout with furniture and fittings of specially selected Queensland timbers made in the Government workshop, and is fully provided with an infinite variety of stainless steel and chromium plated laboratory and sanitary fittings, all fabricated in Queensland.

British Medical Association News.

SCIENTIFIC.

A meeting of the New South Wales Branch of the British Medical Association was held on June 22, 1939, at the Royal North Shore Hospital of Sydney. The meeting took the form of a number of clinical demonstrations by members of the honorary staff of the hospital. Parts of this report appeared in the issues of September 23 and October 14, 1939.

Ruptured External Meniscus.

Dr. A. R. Hamilton showed a male patient, aged seventeen years, who had suffered from pain in his left knee for the past nine years. The pain had been worse during the past three months. There was no history of trauma; but the patient stated that when he rode a bicycle the knee locked and was very painful. It unlocked suddenly and the joint clicked during movement.

On examination he was found to have a tender swelling in the line of the joint on the outer side and beneath the external lateral ligament. Some tenderness was present on the medial side of the joint, and extension of the knee from the flexed position produced a click in the region of the lateral meniscus. Radiographic examination revealed no abnormality.

A provisional diagnosis was made of a torn lateral meniscus, with the lateral portion displaced from between the articular surfaces. The tumour was too elongated to be a cyst of the external meniscus, and the presence of a click was fairly definite evidence of a tear of the meniscus.[1]

Possible Localized Fibrocystic Disease.

Dr. Hamilton also showed a female patient, aged twelve years, who had first consulted him in November, 1938; she had been suffering from weakness in the left arm for two months.

Examination revealed that the pain and tenderness were confined to the head of the humerus, chiefly on its anterior aspect. The tenderness was severe. There was no effusion into the joint, and clinical examination revealed no swelling or tumour formation. Although the deltoid muscle was considerably atrophied, it was not paralysed.

Radiographic examination revealed a large area of rarefaction involving half the head of the humerus, greater tuberosity and the upper part of the shaft of the humerus; it suggested fibrocystic disease and possibly a fracture through the greater tuberosity.

The number of leucocytes was normal, and neither the Mantoux nor the Casoni test elicited a reaction.

The child subsequently fell on her shoulder and sustained a pathological fracture, which rapidly united. It was decided to place the patient under observation, and a cuff and collar sling was provided to keep the arm at rest; this was subsequently supplanted by an abduction arm splint and progressive radiographic examinations were made. The pain slowly diminished and the tenderness became more localized and less severe. At the same time radiographic examinations revealed that the bone was becoming less cystic in appearance and was gradually assuming an enchondromatous appearance. The last report received from the radiologist prior to the meeting, after he had considered all the skiagrams made up to that time, was in the following words:

> There is a transradiant area in the lateral half of the epiphysis of the humerus and in the lateral part of the upper end of the shaft of the diaphysis, especially in the region of the greater tuberosity. There has been a pathological fracture of the upper end of the humerus. The diagnosis lies between (*a*) bone cyst (or possible myxochondroma), (*b*) giant-celled tumour. I think the findings are more in favour of bone cyst or possible myxochondroma.

Dr. Hamilton said that in view of the uncertain nature of the child's complaint, it was felt that any active treatment would be merely experimental and might have untoward results. Deep X ray therapy would not produce any benefit if the condition was either fibrocystic disease or myxochondroma, and therefore it had been decided to keep the joint at rest and watch progress. Admittedly a biopsy might be helpful in diagnosis; but it would not materially affect the treatment, since, if the condition was malignant, amputation or resection would be of very doubtful value and if the condition was not malignant Dr. Hamilton's intention was to wait and watch progress.

Urological Demonstration.

Dr. R. J. Silverton showed a series of lantern slides to illustrate various problems in calculous disease of the urinary tract. Slides from three cases of recurrent renal calculi were shown, and Dr. Silverton pointed out that full preoperative diagnosis was extremely helpful in obviating incomplete removal of calculi at operation on the kidney, the cause of the so-called "false recurrence". In addition to plain skiagrams and excretion urograms, retrograde pneumo-pyelograms should be made when renal calculi were small or multiple. Localization was thus rendered more accurate, and as a consequence access was more sure and direct during operation. In addition to preoperative diagnosis and careful technique during operation, after-treatment should stand out as the third indispensable factor in the prevention of recurrence. In one of the cases discussed, that of a renal pelvic calculus in an adult female, recurrence of a stone of exactly the same size took place within twelve months simply because the patient would not cooperate in the after-treatment. After a second operation she followed all directions as to diet, sufficient vitamins, acidifying or antiseptic drugs and constant dilution of the urine. Dr. Silverton said that several years had elapsed without recurrence and the urine had remained sterile and acid, although the alkaline tendency was previously strong. Another case afforded a good opportunity for pneumo-pyelographic demonstration of multiple calculi in a kidney, the calculi having recurred after operation elsewhere. All the calculi were removed at operation and, in accordance with routine procedure, a normal skiagram was obtained before the patient left hospital. In a third case there had been a threefold recurrence of renal calculi; but operation was successfully undertaken, and after-treatment and after-observation were proceeding most satisfactorily.

Dr. Silverton then demonstrated several interesting varieties of ureteric calculi. He first of all discussed a typical case of small ureteric calculus treated in the routine way by dilatation of the ureter and ureteric meatotomy by the electric wire meatotome. He then showed lantern slides from a case in which a chain of

[1] Since this patient was shown operation has been performed and an unusual condition was found. This was a very thick disk meniscus with a complete bucket-handle tear, the outer portion being displaced laterally from between the articular surfaces. With considerable difficulty the meniscus was removed *in toto*.

ureteric calculi were present at the lower end of one ureter, coexisting with a small vesical calculus. Suprapubic cystotomy had been performed, with removal of the bladder stone, followed by slitting of the anterior wall of the entire length of the intramural portion of the ureter, removal of the chain of calculi so exposed, and finally repair of the long incision so made with interrupted catgut sutures. Complete closure of the bladder followed, with drainage by urethral catheter.

Dr. Silverton finally discussed a case of a large calculus embedded in a ureterocele or balloon-like cyst of the lower end of one ureter protruding into the bladder. The whole treatment was carried out perurethrally. First, a long incision, actually about three centimetres in length, was made through the wall of the cyst by a wire electrode and the cutting current, through the cystoscope. The stone was then tilted into the bladder cavity by means of the same electrode, which was stiff enough for this purpose, and finally the stone was crushed and the fragments were evacuated. The bladder was drained by a urethral catheter for a few days, after which the patient left hospital. A few months later cystoscopy showed that the ureteric orifice concerned had shrunk to respectable dimensions; it was still somewhat large, but was immensely preferable to the tiny pin-point orifice which had previously existed on the surface of the ureterocele.

Achalasia of the Renal Pelvis in Childhood.

Dr. Colin Edwards showed a female patient, aged six years, who had complained of pain in the right loin of ten weeks' duration, and of recurrent pyuria, fever, listlessness, and anorexia of three months' duration. The urine could be sterilized with sulphanilamide, but pyuria always recurred in a few days.

Physical examination revealed no abnormality; but the urine was foul with pus and mixed organisms. An X ray film of the urinary tract revealed no abnormality. An excretion urogram revealed a normal left kidney and ureter with good function; but on the right side the pelvis was dilated without any obvious cause, as the ureter appeared to be normal. Cystoscopic examination showed that the calyces of the right kidney, particularly those of the upper pole, were grossly dilated. Before operation the urine was sterilized with sulphanilamide.

At operation the right kidney was found to be normal in size and position; but the pelvis was not visible from the anterior aspect. This suggested incomplete rotation. There was slight external constriction at the uretero-pelvic junction. Ureterolysis was performed, but no obstructing bands or vessels were found. At this stage mechanical stimulation of the renal pelvis produced peristaltic waves, which stopped abruptly at the uretero-pelvic junction. Denervation of the ureter was performed without effect on the abnormal peristalsis. Denervation of the renal pedicle was then performed, and observation of the peristalsis then revealed an unobstructed wave passing from the pelvis to the ureter.

Dr. Edwards said that convalescence was uneventful. No urinary antiseptics had been used since the operation six weeks previously, but the urine had remained sterile. The child was vivacious and had gained in weight.

Retinitis Pigmentosa.

Dr. H. L. St. Vincent Welch showed four patients representing different degrees of *retinitis pigmentosa*. He said that they were shown mainly with the object of demonstrating the variable age of onset of premonitory nyctalopia, the changes in the disks and vessels, and pigment formation. Two of the patients were sisters, aged ten years and nineteen years respectively; in each the condition was already far advanced, masses of "bone-corpuscle" pigment being present, accompanied by considerable yellowing of the disks and pronounced constriction of the vessels. Two boys of the same family, aged twelve years and sixteen years respectively, were unaffected, at least up till that time, though the condition was present to a pronounced degree in the father, aged forty-two years. No member of the family showed any other stigmata, for example, supernumerary digits or deafness.

The third patient, a girl, aged nineteen years, had complained, some four years previously, of slight deafness and a small degree of nyctalopia. Examination of the fundi had revealed a yellowish tinge of each disk, and the retinal vessels had been of a calibre which seemed to be slightly smaller than normal. There had been no abnormal pigmentation of the retinæ, while the fields of vision were normal. The provisional diagnosis of *retinitis pigmentosa sine pigmento* had been made. A hypodermic injection of one cubic centimetre of acetylcholine had caused no alteration whatsoever in the calibre of the retinal arteries after five, ten and fifteen minutes. In all, four of these injections were given at intervals of one week and then discontinued. Vitamin *A* was given every day from the date of the first examination, and the fundi were examined every three months. At the end of eighteen months a very small "bone-corpuscle" appeared in the left retina, definitely establishing the diagnosis; but no other change occurred for a further six months, when one more spicule was added to the existing "bone-corpuscle". Meanwhile the right retina remained completely free. It was not until another year had elapsed that several more "bone-corpuscles" appeared in the left retina, while two minute patches had developed in the right retina. Very little, if any, further change had occurred during the past year. Pigment formation had been very slow indeed, and, as the patient had been taking cod liver oil almost continuously over the whole period, the question arose as to whether this intake of vitamin *A* had had any influence upon the rate of progress of the disease.

The fourth patient in the series was a man, aged forty-three years, whose visual acuity was still $^6/_6$ in each eye; but the contraction of both fields of vision was so extreme that the area remaining, as represented upon the chart, could be covered by the top of a lead pencil. It was clear from the history that the nyctalopia must have been well established at the early age of four years, since the patient "always had to sit on the doorstep when the other children were playing in the dusk out in the road", because he could not see.

Trachoma.

Dr. St. Vincent Welch's next patient was a female suffering from trachoma; she was shown to illustrate the result of treatment by "Proseptasine". The patient had been treated by the usually accepted methods for more than six years, with some degree of relief; but relapses had been very frequent. During this period she had been unable to face ordinary daylight unless wearing dark glasses. Six weeks prior to the meeting treatment with "Proseptasine" was begun; the patient received 15 grains three times a day, the total daily dose being 42 grains. At the end of a week she was able to discard the dark glases and had not since felt the need for them. Progressive improvement had taken place. At the end of the first week the total daily dosage of "Proseptasine" was reduced from 42 to 37·5 grains.

Dr. St. Vincent Welch submitted the notes of a similar case, in which the improvement had been much more dramatic. A man, aged thirty-six years, having suffered from trachoma for fourteen years, was treated by the usual methods for a week as a control. Meanwhile he lay all day with his face buried in the pillow on account of pain and photophobia, and showed no improvement. This treatment was then discontinued and "Proseptasine" was used. Within two days he could face the light without difficulty; at the end of a week both eyes were "white" and wide open, and he felt no discomfort whatsoever; in a little less than three weeks all trace of pannus had disappeared and it would have been found impossible to say that the patient had ever been the subject of trachoma. Attention was drawn to the fact that the various sulphanilamide compounds were said to abolish those secondary infections which, engrafted upon trachoma, caused ocular damage, the cause of trachoma itself being unaffected; and that if this were indeed so, then Sir Herbert Parsons would still be correct in writing of "that degree of amelioration which usually passes for a cure". Furthermore, it was pointed out that, according to the recent literature, certain organisms, for example the pneumococcus, were destroyed

by one sulphanilamide compound while remaining unaffected by others, and that since various types of infection might be secondary to trachoma, it might well prove necessary to determine the appropriate compound in each individual case.

Ocular Torticollis.

Dr. St. Vincent Welch then showed a boy, aged sixteen years, who two years previously had been the subject of a right ocular torticollis, the result of over-action of the inferior oblique muscle of the left eye. A left divergent concomitant strabismus was also present. Removal of a section of the belly of the left inferior oblique muscle had cured not only the torticollis but also the strabismus, a result which appeared to lend weight to the contention that the strabismus was often secondary to the condition of over-action of the inferior oblique muscle.

Amblyopia ex Anopsia.

Dr. St. Vincent Welch next showed two patients with *amblyopia ex anopsia*, with the object of demonstrating (*a*) the degree of recovery of visual acuity in the amblyopic eye that might be obtained by the use of continuous occlusion of the fixing eye for so long as there was any sign of improvement in the acuity of the amblyopic eye, and (*b*) the utter futility of partial or intermittent occlusion. One child, aged eight and a half years, had squinted for more than half of his total life. When continuous occlusion was commenced six months earlier the visual acuity of the amblyopic eye was $^6/_{36}$; at the time of the meeting it was $^6/_6$. The other child, aged seven years, had squinted for almost half of his total life. The visual acuity of the amblyopic eye six weeks prior to the meeting was $^6/_{36}$; now, after continuous occlusion of the fixing eye, it was already $^6/_{12}$ (part). Dr. St. Vincent Welch mentioned that whereas Worth, of London, tabulating the results in over 1,000 cases in which continuous occlusion was the form of treatment, maintained that the outlook for recovery of useful vision was very gloomy if the squint had existed untreated for more than half the child's total life, the results usually obtained in Australia did not confirm this pessimistic attitude. Stress was laid upon the fact that the occlusion had to be continuous; that it might be necessary to continue the occlusion for a considerable time, up to a year or more in some cases, and that it was often difficult, if not impossible, to secure the cooperation of child, parent and school should the child be of school age.

Congenital Word Blindness.

Dr. St. Vincent Welch's final patient was a girl, aged ten years, suffering from congenital word blindness. She was presented as representative of six similar patients, all successfully treated during the past four years by a new method which he had devised. Dr. St. Vincent Welch said that the outstanding features of the condition known as congenital word blindness were the following: (i) complete or almost complete inability to appreciate printed or written words or even the letters of the alphabet—in other words, inability to read (some children of nine or ten years of age had been unable to learn the alphabet even after special tuition for a year or more); (ii) absence of any visual defect sufficient to explain this inability to read, though the children were often sent for examination of the eyes because it was thought that they could not see; (iii) absence of any mental defect other than that giving rise to the condition of word blindness, the subjects being indeed very frequently on a higher plane of intelligence than others of a similar age group; (iv) unimpaired ability to appreciate printed or written figures, the subjects often being particularly advanced in arithmetic; (v) unimpaired ability to receive instruction aurally; (vi) a good, usually a very good, memory. It had been not uncommon to find that such children had disguised their reading disability for a considerable period by learning aurally the complete contents of the reading book and reciting their part of the lesson as though reading it.

Dr. St. Vincent Welch pointed out that the condition was due to interference, of congenital origin, with the word memory centre situated in the cerebral hemisphere of the side opposite to that of the master hand—in the left hemisphere in a right-handed individual and *vice versa*. He said that he found it impossible to overemphasize the importance of recognizing these individuals for what they were, since, being unrecognized as suffering from congenital word blindness, they would be branded as "lazy", "inattentive" or "mentally deficient", and condemned to bear throughout life the tremendous handicap of illiteracy. On the other hand, no mentally deficient individual should be classed as suffering from congenital word blindness. Dr. St. Vincent Welch said that it should be realized by all members of the medical profession that the condition was not so uncommon as they might be led to believe, as witness the six patients all seen by him within the space of four years during the normal course of ophthalmic practice. He told members that the first case recorded in the literature was described by Morgan in 1896, and that he and all subsequent writers, with one exception, had adopted towards prognosis an attitude of pessimism amounting to hopelessness; even the exception, Hinshelwood, referred to the years of unremitting toil necessary on the part of pupil and teacher in order that the former might perhaps ultimately learn to read.

Dr. St. Vincent Welch had wondered, therefore, whether by making a right-handed individual completely left-handed, or a left-handed person right-handed, it might not be possible to "switch-in" the hitherto silent word memory centre of the other hemisphere by way of a fresh set of association fibres; and he had been profoundly astonished to find that not only was it possible to do this, but that he had thereby "switched-in" a word memory centre already fully furnished with a store of word pattern memories ready for use. This centre was seemingly capable of receiving and storing up word patterns, but incapable, in ordinary circumstances, of emitting them; so that within four weeks of commencing the "change-over" from the use of one hand to that of the other, each of the six patients was reading quite well, and one boy, aged nine years, who had been unable to read or appreciate the meaning of even such monosyllables as "if", "of", "to", had "got hold of Robinson Crusoe and read it from end to end and loved it" (his mother's words) a little more than three weeks after the beginning of treatment.

Dr. St. Vincent Welch, in conclusion, said that in view of the huge handicap, not to say the injustice, suffered by patients whose condition was unrecognized, and of the surprisingly rapid and easy cure that this method of treatment offered, he intended making a further and much fuller contribution upon the subject in the near future.

This case aroused considerable interest and discussion among members. The generally expressed opinion was that individual members were sure that they encountered such cases without realizing their true significance, and that they would be on the look-out for the condition in the future.

DR. D. W. H. ARNOTT said that he had under his care at that time several patients with congenital word blindness, and that efforts were being made to teach them to read by means of the tactile sense. He would certainly try the new method.

Post-Graduate Work.

LECTURES IN WAR MEDICINE AND SURGERY.

THE New South Wales Post-Graduate Committee in Medicine announces that arrangements have been made for a series of lectures in war medicine and surgery, to be delivered at the Stawell Hall, the Royal Australasian College of Physicians, 145 Macquarie Street, 4.30 to 6 p.m., as follows:

October 30.—"General Considerations with Regard to War Wounds", Wing-Commander H. R. G. Poate.

November 2.—"Principles of Medical Epidemiology, including Factors Governing the Spread of Disease, Sources of Infection, Transmission of Disease, and Disease Control", Captain A. H. Baldwin.
November 6.—"Shock and its Treatment", Colonel J. C. Storey, O.B.E., V.D.
November 9.—"Gastro-Intestinal Diseases Occurring Particularly in Military Service, with a Special Reference to Diarrhœa and Dysentery", Captain A. H. Baldwin.
November 13.—"Surgical Treatment of Head, Chest and Abdominal Injuries", Major G. Bell, O.B.E.
November 16.—"Tropical Medicine in its Military Aspects", Captain A. H. Baldwin.
November 20.—"Treatment of Compound Fracture of the Limbs, Joint Injuries and Points regarding Amputation", Colonel Wilfred Vickers, D.S.O., V.D.
November 23.—"The Nervous Factor in War Service, from Recruiting to Discharge", Major C. K. Parkinson, M.C.
November 27.—"Anæsthesia in Relation to War Conditions", Major W. I. T. Hotten.
November 30.—"Protective Inoculation", Major S. A. Smith.
December 4.—"Blood Transfusion", Dr. E. F. Thomson.

Further details of the lectures, admission to which will be free, may be obtained from the Secretary, New South Wales Post-Graduate Committee in Medicine, the Prince Henry Hospital, Little Bay, Sydney.

WEEK-END COURSE AT ORANGE.

The New South Wales Post-Graduate Committee in Medicine announces that, in conjunction with the Western Medical Association, it will hold a week-end course at Orange on Saturday, November 4, and Sunday, November 5, 1939. The programme is as follows:

Saturday, November 4, 1939.

(At Hotel Canobolas.)

3 p.m.—Adjourned annual meeting of the Western Medical Association. General meeting.
4 p.m.—"Medical Disorders of Liver Function", Dr. C. G. McDonald. To be followed by discussion.
8.15 p.m.—Moving pictures illustrating methods of breech delivery, Dr. R. I. Furber.

Sunday, November 5, 1939.

(At Hotel Canobolas.)

10 a.m.—"Coronary Disease and Rheumatic Carditis", Dr. C. G. McDonald.
11 a.m.—"Common Gynæcological Diseases: Trichomonas, Erosion *et cetera*", Dr. R. I. Furber.
12 noon.—"The Differential Diagnosis of Coma", Dr. C. G. McDonald.
2 p.m.—"Uterine Hæmorhages: Causes, Treatment *et cetera*", Dr. R. I. Furber. To be followed by discussion.

The fee for the course will be one guinea. Those intending to be present are requested to notify Dr. S. R. Dawes, Box 123, Orange, as soon as possible, and also if they will be present at a dinner which will be held at 6.30 p.m. on November 4.

Correspondence.

THE MEDICO-LEGAL SIGNIFICANCE OF BLOOD GROUP DETERMINATIONS.

Sir: Space forbids full discussion of your editorial of September 16, 1939, but in view of reported impending legislation concerning paternity disputes certain statements, in my opinion, appear to require comment.

(1) Recent literature does not indicate that all immunologists of authority have adopted Bernstein's formulæ without reservation. There have been reported exceptions to Bernstein's second law, which states that the combinations of Group *AB* parent with Group *O* child and Group *O* parent with *AB* child are impossible. Such reported exceptions against the mother cannot be dismissed or explained on the grounds of illegitimacy. Landsteiner and Hirszfeld are quoted as having recommended that, in similar cases, the opinion should be expressed that such exceptions are to be considered in all probability, *but not in certainty* (italics are mine), as evidence of illegitimacy. Attention should be directed to the work of Dawood Matta, of Cairo, who supports Schiff, of Berlin, in his concept that Group *O* possesses a positive and specific antigenic factor (agglutinogen).

If immunologists are prepared to accept Schiff's concept of Group *O*, then it may be that Bernstein's theory, formulated in 1924, based on objective considerations, and assuming only two dominant agglutinogens, *A* and *B*, could have resulted from inadequate premises. It is suggested that mathematicians may evolve a new theory based upon wider objective considerations, and more nearly in accordance with Matta's hypothesis, in which *O* is regarded as a third agglutinogen, sharing Mendelian dominance with *A* and *B*.

(2) Your editorial does not refer to an important point omitted in the majority of discussions of the Bastardy Bill in England. There may be a quite considerable delay in the finalization of the antigen mosaic of an infant's blood group. It may be accepted that numbers of infants do not have their blood groups established definitely and completely until, at a conservative estimate, six months of age.

Admittedly the demonstration of either *A* or *B* agglutinogen in the child's cells, even in the absence of any demonstrable agglutinin in the serum, definitely rules out the possibility of the child belonging to Group *O*. Figures summarizing the results of Happ, which may be read in Lattes's work "Individuality of the Blood" or in Smith and Glaister's "Recent Advances in Forensic Medicine", may be illuminating. These figures and consideration of that section of Lattes's work dealing with the ontogenetic development of the blood groups make one cautious about categorical statements concerning disputed paternity where young infants are concerned.

(3) Admittedly the performance of blood grouping tests for medico-legal purposes should be carried out in a centralized laboratory by experienced investigators, but the suggestion in your editorial that the importance and extent of this subject are not realized in this country should be modified.

For some years much preliminary work in this field has been performed in this laboratory. Representations were finally successful in securing the establishment of a medico-legal department within the microbiological laboratory. Since October of last year work has been carried out continuously on the problem of such group determinations. This work is being performed in association with other work of a medico-legal nature and involves the investigation of dried blood stains by the precipitin reaction, using specific anti-animal and anti-human sera for this purpose as a necessary preliminary to more detailed investigations.

The intricacies and technical difficulties referred to in your editorial can be verified in the light of considerable experience. The work must be continuous and pitfalls are many.

To be conclusive, investigations should show the complete pattern of the blood group, that is, the determination of the agglutinin content of the serum fraction as well as the agglutinogen content of the cell fraction of the stain.

It may, however, be taken as a fact that those in authority who are most likely to be concerned in such group determinations for medico-legal purposes have for years been well informed of the extent and importance of

such work in European countries, and that similar comprehensive investigations have been undertaken in this laboratory over a considerable period.

Yours, etc.,

KEITH H. GRIEVE.

Office of the Director-General of Public Health,
Microbiological Laboratory,
Sydney.
October 6, 1939.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 104, of October 12, 1939.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

Temporary Appointment.—The following officer of the Emergency List is appointed for temporary service: Surgeon Lieutenant-Commander Brian Andrew Serjeant, dated 1st September, 1939.

Promotion.—Surgeon Lieutenant Harding Herbert Henshall is promoted to the rank of Surgeon Lieutenant-Commander, dated 23rd October, 1939.

Emergency List.

Promotion.—Surgeon Lieutenant Brian Andrew Serjeant is promoted to the rank of Surgeon Lieutenant-Commander, dated 16th June, 1933.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Reserve.

Appointments.—John Patrick Millar and Samuel Edward Lees Stening are appointed Surgeon Lieutenants, dated 15th September, 1939, and 21st September, 1939, respectively.

AUSTRALIAN MILITARY FORCES.

Second Military District.

Australian Army Medical Corps.

Captain S. J. Minogue is transferred to the Reserve of Officers (A.A.M.C.), 1st September, 1939.

Third Military District.

Australian Army Medical Corps Reserve.

To be Honorary Captains—Noel Pryde, M.M., and Carlyle Sandford Wood, 30th August, 1939, and William Ernest Hewitt, 1st September, 1939.

Research.

KING GEORGE V AND QUEEN MARY MATERNAL AND INFANT WELFARE FOUNDATION.

FUNDS provided by public subscription and by grants from the Commonwealth and State Governments to mark the Jubilee of King George V and Queen Mary have been vested in the King George V and Queen Mary Maternal and Infant Welfare Foundation.

The income from the funds is to be applied by the foundation to grants in aid of the work of investigation and research into the causes and treatment of maternal and neonatal morbidity and mortality, and the encouragement of research and post-graduate teaching in relation to maternal and neonatal welfare.

The foundation has already approved of certain grants for this work and is now inviting further applications for grants. It is proposed that grants be made for a period corresponding as closely as possible to the calendar year, subject to renewal from year to year as required. Applications should be made so that they may be considered in time to permit of approved work being commenced early in 1940.

Forms of application and terms and conditions under which grants will be made are obtainable on request at the office of the Director-General of Public Health.

Proceedings of the Australian Medical Boards.

NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1939, of New South Wales, as duly qualified medical practitioners:

Samuels, John Harris, M.B., B.S., 1939 (Univ. Sydney), Mater Misericordiæ Hospital, Brisbane.

O'Connor, Playford Darcy, M.B., B.S., 1938 (Univ. Adelaide), 8, Castlereagh Street, Sydney.

Wells, Hill Gillman, B.M., B.Ch., 1929 (Univ. Oxford), H.M.A.S. Hobart, c.o. G.P.O., Sydney.

Mondon, Vilcourt Pierre, M.B., Ch.B., 1910 (Univ. Edinburgh), 9, Harris Road, Fivedock.

Obituary.

STEWART WILLIAM FERGUSON.

WE regret to announce the death of Dr. Stewart William Ferguson, which occurred on October 8, 1939, at South Yarra, Victoria.

HARVEY CUSHING.

WE regret to announce the death of Dr. Harvey Cushing, which occurred recently at Newhaven, Connecticut, United States of America.

ROBERT WILLIAM SCHUCH.

WE regret to announce the death of Dr. Robert William Schuch, which occurred on October 9, 1939, at Katoomba, New South Wales.

RONALD GORDON JOHN McENTYRE.

WE regret to announce the death of Dr. Ronald Gordon John McEntyre, which occurred on October 14, 1939, at Sydney, New South Wales.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

McEwen, George, M.B., B.S., 1937 (Univ. Melbourne), P.O. Box 9, Collarenebri.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Cummine, Harold George, M.B., B.S., 1939 (Univ. Sydney), Sydney Hospital, Sydney.
Humphery, Ronald James, M.B., B.S., 1938 (Univ. Sydney), Hamilton Road, Fairfield.
Low, David Irving, M.B., B.S., 1935 (Univ. Sydney), Alexandra Street, Kurri Kurri.
Macourt, Henry Ross, M.B., B.S., 1938 (Univ. Sydney), 54, Roseville Avenue, Roseville.
Parie, Francis Sherlock, M.B., 1939 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Wilshire, John Matcham, M.B., B.S., 1939 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.

Notice.

KNOX'S MEDICAL DIRECTORY.

THE attention of readers is directed to the advertisement and order form appearing on page xix in THE MEDICAL JOURNAL OF AUSTRALIA ADVERTISER of this issue. All those who wish to obtain a copy of Knox's Medical Directory, 1940, at the pre-publication price of 21s. are asked to complete the form in the advertisement and to send it to the Manager, Australasian Medical Publishing Company, Limited, Seamer Street, Glebe, New South Wales, before October 27, 1939.

Diary for the Month.

OCT. 24.—New South Wales Branch, B.M.A.: Medical Politics Committee.
OCT. 25.—Victorian Branch, B.M.A.: Council.
OCT. 26.—New South Wales Branch, B.M.A.: Branch.
OCT. 26.—South Australian Branch, B.M.A.: Branch.
NOV. 1.—Western Australian Branch, B.M.A.: Council.
NOV. 1.—Victorian Branch, B.M.A.: Branch.
NOV. 2.—South Australian Branch, B.M.A.: Council.
NOV. 3.—Queensland Branch, B.M.A.: Branch.
NOV. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
NOV. 10.—Queensland Branch, B.M.A.: Council.
NOV. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
NOV. 15.—Western Australian Branch, B.M.A.: Branch.
NOV. 21.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments.

Dr. F. K. Norris has been appointed a Member of the Medical Board, pursuant to the provisions of the *Medical Act*, 1928, of Victoria.

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Dr. F. R. T. Stevens has been appointed a Medical Inspector of Seamen for the purposes of the *Navigation Act*, 1912-1935.

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Dr. A. E. Machin, Dr. H. G. Wallace, Dr. G. J. Cuthbert, Dr. G. M. Barron and Professor Harvey Sutton have been appointed Members of the State Council of Physical Fitness of New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xvi-xviii.

COMMONWEALTH DEPARTMENT OF HEALTH: Medical Officer.
DEPARTMENT OF PUBLIC HEALTH, PERTH, WESTERN AUSTRALIA: Medical Officer.
MATER MISERICORDIÆ PUBLIC HOSPITALS, BRISBANE, QUEENSLAND: Honorary Assistant Ophthalmic Surgeon.
SURAT DISTRICT HOSPITAL, SURAT, QUEENSLAND: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	Wiluna Hospital. All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.